




Validation report form for post-registration changes for component project activities

(Version 01.0)

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

BASIC INFORMATION

Title and UNFCCC reference number of the component project activity (CPA)	CPA 9889-0002: PoA for Promotion of the Improved Water Mills (IWM) in Nepal
Version number of the validation report on CPA PRCs	1.4
Completion date of the validation report on CPA PRCs	19/05/2019
Version number of PoA-DD and CPA-DD applicable to this validation report	PoA-DD version 10.0, dated 22/04/2019 CPA-DD version 4.0, dated 22/04/2019
Title and UNFCCC ref. no. of the registered PoA into which the CPA is included	PoA for Promotion of the Improved Water Mills (IWM) in Nepal (UNFCCC – 9889)
Type(s) of CPA PRCs	<input type="checkbox"/> Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines <input type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of monitoring plan <input checked="" type="checkbox"/> Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools <input type="checkbox"/> Changes to the project design <input type="checkbox"/> Changes specific to afforestation and reforestation activities
Coordinating/managing entity	Alternative Energy Promotion Centre (AEPC)
Host Parties	Nepal
Applied methodologies and standardized baselines	AMS-I.B. ver. 12 - Mechanical energy for the user with or without electrical energy
Mandatory sectoral scopes linked to the applied methodologies	1: Energy industries (renewable/non-renewable sources)
Conditional sectoral scopes linked to the applied methodologies, if applicable	NA
Name and UNFCCC reference number of the DOE	EPIC Sustainability Services Private Limited (E-0062)
Name, position and signature of the approver of the validation report on CPA PRCs	Mr. Krishnachar Sudheendra 

	(Head - Operations)
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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 Post Registration Changes of the registered CDM programme of activity titled "PoA for Promotion of the Improved Water Mills (IWM) in Nepal" (UNFCCC reference number: 9889) – CPA # 2. The objectives of this verification are to verify and certify emission reductions reported for project activity for the monitoring period of 09/09/2015 to 31/12/2017 (first and last day included); and to verify that the data reported are complete and transparent. During verification, permanent changes from the registered monitoring plan with respect to sampling approach is identified. So, the verification scope also includes assessment of post registration changes of the project monitoring plan.

This validation is an independent and objective review of the permanent changes to the registered monitoring plan in the CPA-DD. The information in these documents is reviewed against the CDM Validation and Verification Standard for Programme of activities, VVS-PoA (version 02) (hereinafter referred to as VVS-PoA) and Project Standard for Programme of activities (version 02) (hereinafter referred to as PS-PoA), Kyoto Protocol requirements and UNFCCC rules. The report is based on the assessment of the revised PoA-DD, version 10.0, CPA-DD 02, version 4.0, monitoring report, emission reduction spreadsheet, application of standard auditing techniques including but not limited to desk review, follow up actions (e.g., on site visit, electronic (telephone or e-mail) interviews) and also the review of the applicable approved methodological and relevant tools, guidance and CDM decisions.

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.

This report summarizes the findings of the validation of permanent changes to the registered monitoring plan in the revised CPA-DD. EPIC has employed a risk-based approach in the validation based on the recommendations in the Validation and Verification Standard, Version 2.0, Project standard, Version 2.0, focusing on permanent changes to the registered monitoring plan. The validation is not meant to provide any consulting towards the client. However, the stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring plan and the project design.

Validation summary

The following permanent changes are made in the registered CPA-DD:

- The revised CPA-DD reflecting the post-registration changes is prepared using the latest available version of CPA-DD form (version 08.1) on CDM website. Some editing and restructuring of information has been done by CME, due to change of CPA-DD template from old version to new version.
- The sampling approach has been changed from 'simple random' in the registered design documents to 'stratified random' in the revised design documents (refer Appendix 4 of revised CPA-DD), as the same has been followed during the monitoring period.

The actual permanent changes to the registered monitoring plan in the CPA-DD, meet the provisions described in the para 227 and para 235 of the Project Standard for Programme of

activities (PS-PoA), version 2.0. Further, the changes to the monitoring of a registered CPA have no material impact on the applicability of the applied methodologies or the accuracy and completeness of the monitoring and it is as per para 1C of Appendix 2 (**Indicative list of post-registration changes that may be suitable for approval under the issuance track**) of PS-PoA, version 2.0. Though the identified PRC is suitable under issuance track, the validation team reports the post registration changes and requests the approval under prior-approval track.

SECTION B. Validation team, technical reviewer and approver

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B.1. Validation team member

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			
						Document review	On-site inspection	Interviews	Validation findings
1.	Team Leader	IR	Anbazhagan	Prabu Das	EPIC, Central office, Bangalore	√	√	√	√
2.	Host Country Expert	ER	Narendra	Ghimire	EPIC, Central office, Bangalore	√	√	√	√

B.2. Technical reviewer and approver of the validation report on CPA PRCs

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	G	Vishnu	EPIC, Central office, Bangalore
2.	Technical Expert assisting TR also Approver-Head Operations	IR	Krishnachar	Sudheendra	EPIC, Central office, Bangalore

SECTION C. Means of validation

C.1. Document review

>>The validation team has reviewed the registered PoA-DD version 8.0, and the CPA-DD version 2.0 and its corresponding validation reports, monitoring report, Emission reduction spreadsheet, survey documents and additional background documents (listed in Appendix 3 of this report) submitted by the project participant and the submitted revised PoA-DD version 10.0 and CPA-DD version 4.0. Based on the review, the validation team issued corrective action requests/ clarification requests, please refer to Appendix 4 of this report for the list of CAR/CLs and their closures.

C.2. On-site inspection

This assessment is part of the verification process of the first monitoring period (09/09/2015 to 31/12/2017).

C.3. Interviews

This assessment is part of the verification process of the first monitoring period (09/09/2015 to 31/12/2017).

C.4. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with CPA-DD form	-	-	-
Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines	-	-	-
Corrections	-	-	-
Changes to the start date of the crediting period	-	-	-
Inclusion of monitoring plan	-	-	-
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools	02	01	-
Changes to the project design	-	-	-
Changes specific to afforestation and reforestation project activities	-	-	-
Others (please specify)	-	-	-
Total	02	01	-

SECTION D. Validation findings**D.1. Compliance with CPA-DD form**

Means of validation	As per VVS version 2.0 ^{4/} , the validation team has determined whether the CPA-DD was completed using the valid version of the applicable CPA-DD form. The validation team has checked whether all the sections of the CPA-DD follows the guidelines provided in the template itself.
Findings	NA
Conclusion	CME has used the version 8.1 of the CDM-CPA-DD-FORM template/17/ which is current and active one. The CPA-DD has been prepared as per the instructions provided in the template. The validation team has concluded that the CPA-DD (both in track-change and clean versions) was completed using the valid version of the applicable CPA-DD form and has followed the guidelines given in the template itself. Since the CME has used the later version of the CPA-DD form than the version of the CPA-DD form of the registered CPA-DD, the validation team also confirms that the information transferred to the later version of the CPA-DD is materially the same as that in the registered CPA-DD.

D.2. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

Means of validation	NA
Findings	NA
Conclusion	NA

D.3. Corrections

Means of validation	NA
Findings	NA
Conclusion	NA

D.4. Changes to the start date of the crediting period

Means of validation	NA
Findings	NA
Conclusion	NA

D.5. Inclusion of monitoring plan

Means of validation	NA
Findings	NA
Conclusion	NA

D.6. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

Means of validation	<p>Permanent changes to the registered monitoring plan is observed with respect to the sampling approach applied to the programme, and this permanent change is assessed as per Para 227, 235 and Appendix 2 of PS-PoA Ver 2.0, and as per para 265 - 268 of VVS-PoA version 2.0.</p> <p><u>Note on types of IWM and their operational characteristics:-</u> The short shaft and long shaft IWMs have different capacities and the long shaft offer additional services than the short shaft IWMs. The short shaft offer only one service (grinding) whereas the long shaft offer more than one services (hulling, oil expelling, etc). In Nepal, the classification of the regions as “ecological and development regions” is primarily done for political and administrative purposes by the Govt of Nepal, and this classification is verified to have no impact on the operational characteristic’s of the IWM. The IWMs are implemented in areas where adequate head is available, and the operating hours might vary with the type of IWMs, it is not dependent on the type of the regions (“ecological and development regions”). Therefore, the removal of type of regions/zones does not have any impact on the monitoring plan of the PoA. Since the CME being government entity, these classifications as strata were included in the registered PoA for their other socio-economic monitoring and reporting, however now for CDM purpose, to simply the monitoring these classification, as strata, are proposed to be removed.</p> <p><u>IWM types and Sampling approach:</u> As per page 51 (Appendix 5) of the registered PoA DD, IWMs are to be selected randomly from the entire population using simple random sampling but the monitoring plan sections (B.7.1) of the registered PoA-DD and D.7.1 of CPA-DD (CPA 1) mentioned that for the IWM types, development regions and ecological belts are to be considered to get best representative values. The sampling approach described in Section B.7.1 of the PoA-DD and D.7.1 of the CPA-DD is pertaining to stratified random sampling as different strata short shaft and long shaft) are involved. Moreover, the parameters to be monitored i) $Q_{OP,I}$ - “Number (quantity) of IWMs of type i operating under the project activity” ii) $OH_{i,y}$ - “Operating hours of IWM for generation of mechanical energy” are dependent on the type of IWM only, which can be effectively monitored through stratified random sampling approach. Therefore, the identified inconsistency between section B.7.1 and Appendix 5 of the registered PoA-DD is corrected and the referral of ‘development regions and ecological belts’ is now removed in the revised PoA-DD, and the same correction is applicable to the CPA-DD as well. The removal of ‘development regions and ecological belts’ do not impact the monitoring of the PoA/CPA, and the completeness of monitoring is not compromised. The information is updated in the revised CPA-DD version 4.0.</p> <p>Since the changes refer to inconsistency in defining the sampling approach for the PoA, the changes are validated to have no material impact on the applicability of the applied methodologies or the accuracy and completeness of the monitoring; hence it meets the para 1c of Appendix 2 “Indicative list of post-registration changes that may be suitable for approval under the issuance track” of PS-PoA, version 2.0.</p> <p>The validation team is of the opinion that the actual sampling approach followed for the project activity pertains to stratified random sampling, as different strata (short shaft and long shaft) are involved and this is as per Sampling and survey guidelines, version 3.0 (EB 75, Annex 8). It is further confirmed that stratified</p>
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	random sampling is more appropriate to the project activity, since different IWM types (long and short shaft) are applicable to the project activity, stratified random sampling yields best representative values. In the revised CPA-DD version 4.0, the referral of simple random sampling approach is replaced with stratified random sampling approach, and the corresponding sample size determinations equations corrected and the sample size are provided for each stratum of the monitored parameters. The changes are made in Appendix 4 of the revised CPA-DD.
Findings	Two CLs (CL 01 to CL 02) and CAR 01 are raised in this section.
Conclusion	<p>The validation team confirms that</p> <ul style="list-style-type: none"> - The revised monitoring plan does not reduce the level of accuracy of the monitoring compared with the requirements contained in the registered CPA-DD. - The same version of the methodology and “Standard for sampling and surveys for CDM project activities and programmes of activities” has been considered by the CME. The proposed changes do not lead to any deviation from the applied methodology/tools. - The revised sampling approach complies with the applied methodology and sampling guidelines is suitable for the project activity population. <p>This change is reported as Post registration changes to the registered monitoring plan, and the change is assessed to be as per para 235 of PS-PoA and the changes are validated to be as per Para 1c of appendix 2 of PS-PoA, version 2.0, as monitoring for the covered monitoring period (09/09/2015 to 31/12/2017) has been conducted following the stratified sampling approach. Though the identified PRC is suitable under issuance track, the validation team reports the post registration changes and requests the approval under prior-approval track.</p>

D.7. Changes to the project design

Means of validation	NA
Findings	NA
Conclusion	NA

D.8. Changes specific to afforestation and reforestation project activities

Means of validation	NA
Findings	NA
Conclusion	NA

SECTION E. Internal quality control

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After the completion of PRC assessment by the validation team all the relevant documentation is submitted to a qualified, Independent Technical reviewer as part of EPIC’ internal quality control system. A Technical reviewer team is appointed to review the draft final validation 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 validation team with justification. The technical review process can also raise issues in this regard which is resolved further by the validation team to the satisfaction of the technical reviewer. The technical reviewer team either accepts or rejects the report made by the validation team. The final report (after resolutions of all findings) is then submitted to the Head-operations for review and approval.

SECTION F. Validation opinion

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EPIC Sustainability Services Private Limited (EPIC) has been contracted by AEPC to undertake the Post Registration Changes of the registered CDM programme of activity titled “PoA for Promotion of the Improved Water Mills (IWM) in Nepal” (UNFCCC reference number: 9889) – CPA#2. The objectives of this contract

with AEPC are to verify and certify emission reductions reported for project activity for the monitoring period of 09/09/2015 to 31/12/2017 (first and last day included). The scope of verification also includes the assessment of post registration change with respect to permanent changes to the registered monitoring plan.

The PRC validation has been performed as described in the VVS-PoA, version 02.0, PS-PoA Version 2.0 and consists of the following steps: - Review of the MR - Desk review of the revised MR, review of registered PoA-DD and submitted revised PoA-DD and CPA-DD for CPA2 and the relevant documents - Site visit & Interviews - Preparation of the PRC Validation Report.

It is DOE's opinion that the revised documentation submitted is conforming to the requirements for Post Registration Changes as stipulated in the Clean Development Mechanism Validation and Verification Standard, Project Standard, version 02. The reported permanent changes to the registered monitoring plan, as per para 235 of PS-PoA are suitable for approval under the issuance track and are as per Appendix 2 of CDM project standard for programme of activities, version 02.0, but prior approval is requested. EPIC further confirms that the permanent changes to the registered monitoring plan is in compliance with the applied methodology AMS-I.B. ver. 12 and the Standard for Sampling and Surveys for CDM project activities and programme of activities, version 04.

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 ₂ e	Carbon Dioxide Equivalent
CR	Clarification Request
DOE	Designated Operational Entity
ER	Emission Reductions
ESSPL	EPIC Sustainability Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse gases
GoN	Government of Nepal
GSC	Global Stakeholder Consultation
IPCC	Intergovernmental Panel on Climate Change
IWM	Improved Water Mill
kW	Kilo Watt
LE	Leakage Emissions
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
QA/QC	Quality Assurance/Quality Control
RFP	Request for Proposal
RSC	Regional Service Centre
ToR	Terms of Reference
TWM	Traditional Water Mill
UNFCCC	United Nations Framework Convention on Climate Change
US	User Survey
VVS-PoA	Validation and Verification Standard - Programme of Activities

Appendix 2. Competence of team members and technical reviewers

The following validation team has been assigned to carry out the verification of the project.

Name	Mr. Narendra Ghimire	Mr. A. Prabu Das	Dr G Vishnu	Mr. K. Sudheendra
Role	Host country expert	Auditor- Team Leader	Technical Reviewer	T.E assisting Technical Reviewer
Competence in relevant sectors	Sector 1 including TA 1.1.	Sector 1 and Sector 13 including TA 1.1. and TA 13.1	Sector 1 and Sector 13 including TA 1.1. and TA 13.1	Sector 1
Responsibility	Document review, onsite, DVR preparation, DVR resolution	Document review, DVR preparation, DVR resolution, FVR preparation	Technical review	Technical review

Mr. A Prabu Das, holds a Master of Technology degree in Energy Conservation and Management and Bachelor of Technology Degree in Petro-chemical Technology. He is a certified Energy Auditor by Bureau of Energy Efficiency (BEE), Government of India. He has around 11 years of work experience in Design of biomass Power plants, preparing Techno Economic Feasibility Reports (TEFR), carrying out energy audits, of which last eight years have been in CDM/GS/VCS consultancy and validation/verification services. He has participated in the validation / verification of various CDM/VCS/GS/GHG and sustainability projects globally. He has undergone extensive training on CDM validation and verification and is a qualified lead auditor for Sectoral Scope 1 under Technical Area "TA 1.2 Renewables" in accordance with procedures of EPIC sustainability services Pvt. Ltd. Further, he has been thoroughly trained in Social Carbon's latest Standard and qualified to perform social carbon validation and verification. He is also an ISO 26000 lead auditor certified by Professional Evaluation and Certification Board (PECB). He is a Certified Sustainability Assurance Professional from AccountAbility, UK. Among other qualifications, he is recognised by Gold Standard Foundation to perform fast track audits.

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.

Dr. G. Vishnu holds a Masters and Doctorate in Environmental Science. He has around 8 years of experience in the field of research and consultancy related to water, wastewater, solid waste management systems, implementation of new, Cleaner Production technologies and biomass assessment studies. He has more than four years' experience in validation verification of more than thirty CDM, projects and has undergone extensive training on GHG validation and verification. He is a Lead Auditor for various technical areas. He is also an ISO 26000 lead auditor and ISO 50001 auditor certified by Professional Evaluation and Certification Board (PECB). He is a Certified Sustainability Assurance Practitioner (CSAP) from AccountAbility, UK. He is qualified as Lead Auditor based on EPICs CDM accreditation procedures.

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' qualification criteria.

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	AEPC	PoA-DD titled "PoA for Promotion of the Improved Water Mills (IWM) in Nepal", Version 8.0 and 10.0 CPA 9889-0002: PoA for Promotion of the Improved Water Mills (IWM) in Nepal, Version 2.0 and 4.0	1	Publicly available; CME
2	TUV-SUD	Validation report of PoA-DD	2	Publicly available
	KBS Certification Services Pvt. Ltd.	Validation report of CPA2		
3	UNFCCC	AMS-I.B. ver. 12 - Mechanical energy for the user with or without electrical energy	3	Publicly available
4	UNFCCC	Validation and Verification Standard for Programme of activities, Version 2.0 Project Standard for Programme of activities, Version 2.0	4	Publicly available
5	Sustainable Energy and Technology Management P. Ltd.	IWM User Survey 2016_CPA-1	5	CME
	Universal Consultancy Service Pvt. Ltd.	IWM User Survey 2017_CPA-1 IWM User Survey 2017_CPA-2		CME
6	Third party survey team	Filled in Questionnaires_CPA 1 Filled in Questionnaires_CPA 2	6	CME
7	AEPC	RFP-User Survey 2017_IWM PoA RFP-IWM Emission reduction monitoring study_Final Approved 2016	7	CME
8	UNFCCC	AMS I.F. "Renewable electricity generation for captive use and mini-grid", version 03	8	Publicly available
9	AEPC	CME Manual - PoA for Promotion of the Improved Water Mills (IWM) in Nepal, Version 3.0	9	CME
10	AEPC	MR initial Version 1.0	10	CME
11	AEPC	ER Sheet initial Version 1.0	11	CME
12	AEPC	Database for IWMS included in the CPAs	12	CME
13	UNFCCC	Standard for sampling and surveys for CDM project activities and PoAs (version 07.0)	13	Publicly available
14	UNFCCC	Guidelines on Sampling and surveys for CDM project activities and programmes of activities (version 03.0)	14	Publicly available
15	EPIC	PRC report (Ver 1.4 dated 19/05/2019) of PoA for permanent changes to the registered monitoring plan	15	EPIC
16	AEPC	"Sample calculation PoA spreadsheet" - for sample size calculation for monitored parameters of different strata	16	CME

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

Table 1. CLs from this validation

CL ID	01	Section no.	D.5	Date:20/04/2019
Description of CL				
CME to clarify the number of strata considered in the sampling and to justify the type of sampling approach chosen in the monitoring plan of the PoA				
CME's response				Date: 13/05/2019
<p><u>CME response 01</u> CME has considered two strata for the sampling purpose i.e. types of IWM (Long Shaft and Short shaft). CME has chosen the stratified sampling in the monitoring plan of this PoA as the CPAs includes both long shaft and short shaft IWMs and the parameters of interest may vary according to the types of IWM which simple random sampling may not be representatively capture those parameters for overall PoA and/or CPA.</p> <p><u>CME response 02</u> CME has always opted to take the types of IWMs (long shaft and short shaft) as strata over development regions and ecological belts. As the long shaft IWMs have different capacities and offers additional services than the short shaft IWMs (Short shaft is solely for grinding)(https://www.aepc.gov.np/improved-water-mill), the parameters of interest basically the daily operating hours might be different than the short shaft. Since IWMs are basically implemented in hilly area only which needs certain natural head and flow of water, these characteristics are same in both ecological zones i.e. Hill (accessible hill) and Mountain (remote hill). So, out of three ecological belts of Nepal, IWMs are not implemented in Terai (plain area). But obviously, the services provided by the types of IWMs differ in each area. Similar to these, the service provided by IWMs does not vary according to the development regions but by nature varies with the types of IWMs. CME, being a government entity not only monitors the operational status of the IWMs and operating hours to comply with the CDM requirements but has also clubbed the users socio-economic and satisfaction survey with this to reduce the cost of separate monitoring of IWMs for CDM and other socio-economic survey. To make the socio-economic survey more representatives, CME also try to cover development regions and ecological belts to presents the results in best way. So, CME has tried to incorporate types of IWMs as main strata for the monitoring from the perspective of CDM in PoA DD and CPA-DDs but also incorporated that the survey will try to capture the data from all ecological belts and development regions to get best results for socio-economic indicators. As there was confusion with the development regions and ecological belts during first IR feedback, CME has removed development regions and ecological belts from the revised PoA-DD and CPA-DD keeping the types of IWMs as strata.</p>				
Documentation provided by CME				
Revised PoA DD and CPA DDs				
DOE assessment				Date: 19/05/2019

DOE assessment 01

CME is requested to explain how the daily operating hours are similar for each long shaft and short shaft IWMs implemented across the country for agro processing. For example, that they do not differ for IWMs implemented in different ecological regions and development regions.

DOE assessment 02

It is acknowledged that the short shaft and long shaft IWMs have different capacities and the long shaft offer additional services than the short shaft IWMs. The short shaft offer only one service (grinding) whereas the long shaft offer more than one services (hulling, oil expelling, etc). Nepal is geographically divided into five development regions namely i) Eastern, ii) Central, iii) Western, iv) Mid-western and v) Far-western and the Ecological classification is based on topography, they are i) Terai (plain area) ii) Hill (accessible hill) and Mountain (remote hill). These classifications of the regions as "Ecological and development regions" is primarily done for political and administrative purposes by the Govt of Nepal, and this classification is verified to have no impact on the operational characteristic's of the IWM. The IWMs are only implemented in hilly areas (hill and mountain) where adequate head is available, and the operating hours might vary with the type of IWMs owing to the difference in service it renders, it is not dependent on the type of the regions ("ecological and development regions"). Therefore, the removal of type of regions/zones, as strata, does not have any impact on the monitoring plan of the PoA. Since the CME being government entity, these classifications as strata (Ecological and development regions) were included in the registered PoA for their other socio-economic monitoring and reporting to other government organisations, however now for CDM purpose, to simply the monitoring these classification, as strata, are proposed to be removed. This approach is accepted by the validation team, as it reviewed to have no impact on the CDM monitoring.

The strata considered in the monitoring sampling of the revised PoA are with respect to the type of the IWM i.e Long shaft and short shaft. The referral of 'development regions' and 'ecological zones' are removed from the revised PoA-DD, ver 10.0. The different types of IWM (Long shaft and short shaft) create heterogeneity which justifies the choice of opting stratified random sampling by the CME, for the PoA monitoring. Moreover, the parameters to be monitored i) $Q_{OP,I}$ - "Number (quantity) of IWMs of type i operating under the project activity" ii) $OH_{i,y}$ - "Operating hours of IWM for generation of mechanical energy" are dependent on the type of IWM only, which can be effectively monitored through stratified random sampling approach.

CL 01 Closed

CL ID	02	Section no.	D.5	Date:	07/05/2019
Description of CL					
<u>Clarify the following:</u>					
<p>In regard to calculation of sample size for parameter daily operating hours of IWM, the sampling plan has not defined the expected mean value (i.e. daily operating hours of IWM) and expected standard deviation for each stratum in order to justify the calculation of the sample size. It is to be noted that the expected mean value (i.e. daily operating hours of IWM) and expected standard deviation for each stratum are required in the calculation of sample size by paragraph 62 of appendix 1 of the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities (version 03.0).</p>					
CME's response				Date:	13/05/2019

Para 60 of appendix 1, EB 75 Annex 8, Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 3.0. gives the equation for the total sample size calculation as follows:

$$n \geq \frac{1.645^2 NV}{(N - 1) \times 0.1^2 + 1.645^2 V}$$

Where,

$V = (SD/Mean)^2$

n = Sample Size

N = Total number of IWM users (Entrepreneurs)

SD = Overall standard deviation

Mean = Overall mean operational hours for agro processing

Since the study conducted by independent consultant has given overall SD and overall mean which was assumed while calculating the total sample size and off-course sufficient to do the calculation, it does not need again the SD and mean for each strata. This has been validated by the entity during registration as well. The samples calculation in each stratum also does not require SD and mean for each strata. CME is in the opinion that, if the overall SD and overall mean is not given but the means and SDs for each strata are given, the equations given in para 62 of appendix 1 of the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities (version 03.0) can be used to obtain overall mean and overall standard deviation. From the second monitoring onwards, that will be applicable to calculate the overall mean and overall standard deviation and hence the information provided is sufficient for calculating the samples in PoA-DD and CPA-DD.

Documentation provided by CME

NA

DOE assessment

Date: 19/05/2019

The explanation provided by the CME with respect to application of overall mean and overall standard deviation for sample size calculation is accepted by the validation team

CL 02 Closed

Table 2. CARs from this validation

CAR ID	01	Section no.	D.5	Date	20/04/2019
Description of CL					
<ul style="list-style-type: none"> For parameter number of IWM operating: (i) the sampling plan in the PoA-DD has not provided the standard deviation required by paragraph 24 of appendix 1 of the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities (version 03.0) in order to substantiate the sample size as 29.67 (rounded up to 30), please provide the excel spreadsheet in support of the calculation. For parameter daily operating hours of IWM, the sampling plan has not defined the sample size for each stratum as described by paragraph 66 of appendix 1 of the Guidelines, nor has it provided provision how to calculate sample size for each stratum 					
CME's response					Date : 21/4/2019
<ul style="list-style-type: none"> The appendix 5 of PoA DD and Appendix 4 of the revised CPA DDs address the calculation of the standard deviation required by paragraph 24 of appendix 1 of the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities (version 03.0) and provides the information on total sample size calculation and provision to calculate the sample size in each stratum. The sample calculation spreadsheet is also provides the calculation of standard deviation. The appendix 5 of PoA DD and Appendix 4 of the revised CPA DDs address the calculation of the total sample size and provision to calculate the sample size in each stratum. 					
Documentation provided by CME					
Revised PoA DD and CPA DDs					
Sample Calculation Spreadsheet					
DOE assessment					Date : 22/04/2019

- The value of standard deviation for parameter “Number of IWM operating” is reported as 0.09 which is as per para 24 of *appendix 1 of the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities (version 03.0)*. The value is verified from the submitted excel spreadsheet titled “*Sample calculation PoA*”. The sample size for the stratum ‘long shaft and short shaft’ are calculated to be ‘6’ and ‘24’ respectively and the corresponding calculations are also provided, the calculations are made assuming the maximum capacity of 3000 IWMs per CPA (this information is as per point 2 of Sec K – Eligibility criteria for inclusion of CPAs). The submitted sample size calculation and the information in the PoA-DD are verified to be as per paragraph 29 of appendix 1 of the *Guidelines Sampling and Surveys*. But the actual sample for each monitoring period are proposed to be calculated based on the installed proportion under each CPA.
 - For the parameter “daily operating hours of IWM” The sample size for the stratum ‘long shaft and short shaft’ are calculated to be ‘3’ and ‘13’ respectively and the corresponding calculations are also provided, the calculations are made assuming the maximum capacity of 3000 IWMs per CPA (this information is as per point 2 of Sec K – Eligibility criteria for inclusion of CPAs). The submitted sample size calculation and the information in the PoA-DD are verified to be as per paragraph 66 of appendix 1 of the *Guidelines Sampling and Surveys*. But the actual sample for each monitoring period are proposed to be calculated based on the installed proportion under each CPA.
- Since the sample size calculated for the parameter “Number of IWM operating” results in more conservative sample size of 30 in comparison to the sample size (16) of the parameter “daily operating hours of IWM”, the same sample size is proposed to be adopted for the annual IWM users’ surveys for both the proportional parameter and the mean value parameter for first monitoring period. For the subsequent monitoring periods, the sample size is proposed to be adjusted based on the results of the previous monitoring periods.

CAR 01 Closed**Table 3. FARs from this validation**

FAR ID	NA	Section no.	NA	Date: DD/MM/YYYY
Description of FAR				
NA				
CME’s response				Date: DD/MM/YYYY
NA				
Documentation provided by CME				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

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