



VALIDATION REPORT

for the CDM Project Activity

Micro Scale Biogas CDM Project of CROSS

**In
India**

Report No. 01 997 9105069652

Version No. 02, 2012-12-10

Designated Operational Entity (DOE)

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I. Project description:

Project title:	Micro Scale Biogas CDM Project of CROSS		Report No.: 01 997 9105069652
Host Country:	India		Current revision No.: 02
Methodology:	AMS-I.E, Version 04 (Requests for registration can be submitted until 2013-04-03 23:59:59 GMT)	<input type="checkbox"/> Large Scale <input checked="" type="checkbox"/> Small Scale	Date of current revision: 2012-12-10
			Date of first issue: 2012-06-22
Annual average emission reductions (estimate):			16456 tCO ₂ e/yr
GHG reducing measure/technology:	The purpose of the project activity is to set up 5,000 biogas plants (digesters) of 2m ³ capacity each for each household in Chittoor district where the NGOs is working, and in this way replace Non-Renewable Biomass with biogas for cooking and heating water by capturing the methane from the anaerobic waste. This will contribute strongly to sustainable development of the rural households involved in the project.		

Party	Project Participants	Party considered a project participant	Contract party
India(Host)	Community Reconstruction of Social Service-(CROSS)	No	<input checked="" type="checkbox"/>

II. Validation Team:

Validation Team			Role									
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Team leader	Acting Team Leader	Local Expert	Team Member (Auditor)	Technical Expert	Acting Tech. Expert	Trainee Auditor	Technical Reviewer	Expert to TR	Trainee TR
R. Murali	India	1.2, 3.1	X		X		X					
Ma. Paa. Puratchikkanal	India	1.2, 3.1, 6.1, 13.1, 13.2, 15.1			X	X	X					
Nagaraju Bellapu	India	1.2, 3.1							X			
Indumathi C	India	1.2								X		

(adjust accordingly, i.e. provide one line per person)

Validation Phases and Validation Status:

- ☒ Desk Review
 ☒ Follow up interviews
 ☒ Resolution of outstanding issues
☐ Corrective Actions / Clarifications Requested
 ☒ Full Approval and Submission for Registration
☐ Rejected

III. Validation Report:

Final approval	Released	Distribution
<input checked="" type="checkbox"/>	By: Mr. Praveen Urs	<input type="checkbox"/> No distribution without permission from the Client or responsible organizational unit
Date: 2012-12-14		<input checked="" type="checkbox"/> Unrestricted distribution

Executive Summary – Validation Opinion

The validation team assigned by the DOE (TÜV Rheinland (China) Ltd.), here after called TRC, is been assigned by “Community Reconstruction of Social Service (CROSS) “to perform the validation of their project “Micro Scale Biogas CDM Project of CROSS “. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism. The scope of the validation is defined as an independent and objective review of the project design document, the project’s baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against CDM Validation and Verification Manual (Version 01.2), Kyoto Protocol requirements, CDM Executive Board/UNFCCC rules.

The report is based on the assessment of the project design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, site visit, and stakeholder interviews, review of the applicable methodology and its underlying formulae and calculations.

Validation methodology and process

The validation has been performed as described in the VVM version 01.2 and constitutes the following steps:

- Publication of the PDD on the UNFCCC website (2012-04-20 to 2012-05-19)
(<http://cdm.unfccc.int/Projects/Validation/DB/IBK3RIR7HVE1SZLK7YZMZPZ02UW7TS/view.html>)
- Desk review of the PDD and the relevant documents
- On-site assessment (2012-06-11)
- Issuance of Validation Report

Validation criteria

The following CDM requirements have been considered:

- Article 12 of the Kyoto Protocol,
- Modalities and procedures for CDM (Marrakech Accords)
- Subsequent decisions by the COP/MOP and CDM Executive Board
- Host country criteria
- Criteria given to provide for consistent project operations, monitoring and reporting.

The host party is India and the party fulfil the participation criteria and have approved and authorized the project and the project participant. The DNA from country name confirms that the project assists in achieving sustainable development.

The project correctly applies the baseline and monitoring methodology AMS I.E version 04, “Switch from Non-Renewable Biomass for Thermal Applications by the User”. The project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding toward “India”.

The monitoring plan provides for the monitoring of the project’s emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is TRC’s opinion that the project participants are able to implement the monitoring plan.

By installing the 2m³ household bio-digesters, thermal energy will be generated by recovering the methane from the cow dung thereby the project activity will result in reductions of greenhouse gas (GHG) emissions by displacing the fuel wood usage in the project area that are real, measurable and give long-term benefits to the mitigation of climate change.

The total emission reductions from the project are estimated to be (115194) t of CO₂e over a (Seven) year crediting period, averaging (16456) t of CO₂e annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not alter.

The validation protocol describes a total of 18 findings which include:

- (12) Corrective Action Requests (CARs);
- (06) Clarification Requests (CLs);
- (0) Forward Action Requests (FARs); and all findings have been closed satisfactorily.

TRC concludes that the CDM Project Activity “Micro Scale Biogas CDM Project of CROSS” in India, as described in the PDD (Version 02.1, date 2012-12-06), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board.


The selected baseline and monitoring methodology (AMS I.E, Version 04) is applicable to the project and correctly applied. The TRC therefore requests the registration of the project as a CDM project activity with UNFCCC.

R Murali (Team Leader)



TÜV Rheinland (China) Limited
Bangalore, 2012-12-10

Mr. Praveen Nagaraje Urs (DOE Manager)



TÜV Rheinland (China) Ltd.
Beijing, 2012-12-14

Abbreviations

CROSS	Community Reconstruction of Social Service (CROSS)
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction(s)
CH ₄	Methane
CL	Clarification Request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DRB	Demonstrable Renewable Biomass
EB	Executive Board
ERPA	Emission Reduction Purchase Agreement
FAR	Forward Action Request
FCN	Fair Climate Network
FSI	Forest Survey of India
GHG	Greenhouse Gas(es)
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MCF	Methane Conversion Factor
MNRE	Ministry of New and Renewable Energy
MOEF	Ministry of Environment and Forests
NATMO	National Atlas And Thematic Mapping Organisation
NBMMP	National Biogas and Manure Management Program
NCAER	National Council of Applied Economic Research
N ₂ O	Nitrous Oxide
NCV	Net Calorific Value
NGO	Non-governmental Organisation
NRB	Non-Renewable Biomass
NRSC	National Remote Sensing Centre
NSSO	National Sample Survey Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PCIA	Partnership for Clean Indoor Air
PRA	Participatory Rural Appraisal
RWDS	Rural Women's Development Society
SCINDEA	South Central India Network For Development Alternatives
SSC	Small Scale
tCO ₂ e	Tonnes of CO ₂ equivalents
TRC	TÜV Rheinland (China) Ltd.
UNFCCC	United Nations Framework Convention on Climate Change
VRDP	Village Reconstruction and Development Project
GWP	Global Warming Potential

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Appendix A: Validation Protocol

Appendix B: Certificates of Competence

1. Introduction:

The organization “Community Reconstruction of Social Service (CROSS)” has commissioned the DOE TÜV Rheinland (China) Ltd. to perform a validation of the CDM Project Activity “Micro Scale Biogas CDM Project of CROSS” in India (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. The term “UNFCCC criteria” refers to Article 12 of the Kyoto Protocol, the CDM modalities and procedures or the simplified modalities and procedures for small-scale CDM project activities (as applicable) and the subsequent decisions by the CDM Executive Board.

1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the relevant criteria (see above) and decisions by the CDM Executive Board, including the approved baseline and monitoring methodology. The validation team has, based on the recommendations in the Validation and Verification Manual employed (latest version 01.2) a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

While carrying out the validation, TRC determines if the project activity complies with the requirements of Para 37 of the CDM M&P and also assess the claims and assumptions made in the PDD without limitation on the information provided by the project participants.

The scope of the validation is:

- To apply TRC's own quality management system integrated with the VVM standard along with the recent decisions and guidance provided by the UNFCCC board to determine if the project activity meets all applicable CDM requirements, including those specified in the relevant methodologies, tools and guidelines;
- Assesses the accuracy, conservativeness, relevance, completeness, consistency and transparency of the information provided by the project participants;
- Determine whether information provided by the project participants are reliable and credible;
- Present information in the form of validation report in a factual, neutral, coherent manner and document all assumptions, provide references to the background material and identify changes made to the documentation;
- Base the findings and conclusions on objective evidence and conduct all validation in accordance with CDM rules and procedures;
- Apply consistent validation criteria in providing expert judgments to the requirements of applicable approved methodologies, tools and also cross check the same with projects of similar characteristics, technology, time period and region; and
- Safeguard the confidentiality of all information's obtained or created during validation.
- Where sampling is involved, the standard for sampling and surveys are applied.

Methodology:

The validation consists of the following four phases:

- I. A desk review of the project design documents
 - Publication of PDD in UNFCCC for global stakeholder consultation;
 - A review of data and information;
 - Cross checking between information provided in PDD with all necessary means without limitations to the information provided by the project proponent;
- II. On-site visit and follow-up interviews with project stakeholders
 - Interviews with relevant stakeholders in host country with personnel's having knowledge with the project development via telephone, email or direct on-site visits;
 - Cross checking between information provided by interviewed personnel with all necessary means without limitations to the information provided by the project proponent;
- III. Reference to available information's relating to projects or technologies similar projects under validation and review based on the approved methodology being applied of the appropriateness of formulae and accuracy of calculations.
- IV. The resolution of outstanding issues and the issuance of the final validation report and opinion.

2.1 Desk Review of the Project Design Documentation:

The following table outlines the documentation reviewed during the validation:

Ref no.	Reference Document
/P01/	PDD titled "Micro Scale Biogas CDM Project of CROSS", Version 01, Date 2012-03-15
/P02/	PDD titled "Micro Scale Biogas CDM Project of CROSS", Final Version 2.1, Date 2012-12-06
/P03/	The Ministry of Environment & Forests, Government of India, has accorded approval of voluntary participation for the project "Micro Scale Biogas CDM Project of CROSS" and has confirmed that the project contributes to sustainable development in India as per their letter no. 4/12/2012-CCC dated 2012-08-16 addressed to Mrs. Puvvani Bhupathi, Director of Community Reconstruction of Social Service (CROSS).
/P04/	Modalities of Communication dated 2012-09-24
/P05/	Undertaking letter for ODA dated 2011-04-12
/P06/	Proof of prior consideration.
/P07/	<ol style="list-style-type: none"> 1. Microsoft Excel spread sheets for baseline Demographic survey of Chittoor version 01 2. Microsoft Excel spread sheets for ER calculation version 01 3. Microsoft Excel spread sheets for family size data, version 01
/P08/	Microsoft Excel spread sheets for ER calculation version 02
/P09/	Change Detection Study in the Andhrapradesh, Madyapradesh and Rajasthan Project areas of FES. (http://fes.org.in/download.php?file=ZG93bmXvYWQvd3AxMC5wZGY=) which states that Demand for fuel wood and logs from commons and forests have caused resource degradation to the extent that collection exceeds sustainable yield in the project region.
/P10/	http://www.mnre.gov.in/schemes/decentralized-systems/schems-2/ Secondary source of reference evidenced the Size and requirements of of the available house hold biogas plants which includes 2 m ³ capacity.
/P11/	Deenabhandu Model developed by APFRO (Action for Food Production, New Delhi), Page no 7
/P12/	Evaluation Survey of the National Programme on Improved Chula By NCAER, Ministry of Non-Conventional Energy Sources, Govt Of India, 2001-02 (Appendix Table 3.6, pg no 115 and Appendix Table 5.12, pg no 147)
/P13/	Sustainable Exploitation, Cultivation and Marketing Linkages of Non-Timber Forest Products (NTFPs) in Andhra Pradesh.(page no 46 & 55) (http://forest.ap.nic.in/JFM%20CFM/CFM/Special%20Reports/NTFPs%20in%20AP%20%20by%20TERI/NTFP%20Final%20Report%20July-04.pdf) The report says that Chittor district has least percentage of forest cover and had dominance of dry dedious and scrub forest.This repor also evidenced that Forests in Chittoor showed high anthrogenic pressure.
/P14/	State of Forest Report, 1989. Forest Survey of India, Ministry of Environment and Forests, Government of India (pg no 15, 17, 19, 20, 21,25, 28)

/P15/	FSI, 2011. Chapter 7: Socio-economic contribution of forests: Production and consumption of forest resources in India. State of Forest Report. Forest Survey of India, Ministry of Environment and Forests, Government of India. Page numbers 72, 73 and 76
/P16/	Community Driven Modeling of Social-Ecological Systems: Lessons from Andhra Pradesh, India to evidence that the time spent to collect fuel wood from the forests has been steadily increased since 1960 in the project region.
/P17/	NSSO 2010. National Sample Survey Organization, Household Consumer Expenditure in India, Ministry of Statistics and Programme Implementation, Government of India for the following years <ol style="list-style-type: none"> 1) 1997 - Statement 2.4R - Pg. no 19 2) 1998 - Statement 2.4R - pg. no 22 3) 1999 to 2000 - Table 4R- pg. no 52 4) 2000 to 2001- Statement 2.4R - pg. no 22 5) 2002 - Statement 2.4R (cont.) pg. no 28 6) 2003 - Statement 2.4R (cont.) pg. no 28 7) 2004 to 2005 - Table pg. no A-201 8) 2005 to 2006- Table 4R (pg. no A-8) 9) 2006 to 2007- Table 4R (pg. no A-8) 10) 2007 to 2008- Table 4R (pg. no A-8)
/P18/	Handbook of Statistics, 2009, Chittoor District, Chief Planning Officer, Government of Andhra Pradesh. 2010, evidencing the location (mandals) of the project.
/P19/	"A guide for wood fuel surveys", EC-FAO Partnership Programme (2000-2002). Sustainable Forest Management Programme, Forest Products Division, Forestry Department, FAO and "Biomass Studies; Field Methods for Monitoring Biomass" (1997) by Shailaja Ravindranath and Sudha (1997). Oxford & IBH Publishing Co.Pvt. Ltd. New Delhi. Pg no 120 to 127
/P20/	Biogas Technology, B.T. Nijaguna, New Age International Publishers, New Delhi, 2002. pg no 29, 36, 37, 38, 136 and 157
/P21/	Human Development in India published by Oxford http://www.ncaer.org/downloads/Reports/HumanDevelopmentinIndia.pdf
/P22/	<p>I. "Bioenergy in India" Prepared for International Institute for Environment and Development (IIED) by The Energy and Resource Institute (TERI) in October 2010. (http://pubs.iied.org/pdfs/G02989.pdf)</p> <p>II. http://www.techno-preneur.net/technology/new-technologies/Energy/biogas.htm A secondary source of reference stating that "a biogas plant of 2 m3 capacity is sufficient for providing cooking fuel to a family of four to five"</p>
/P23/	Kitchen Performance Test (KPT), Version 03 Prepared by Rob Bailis with input from Kirk R. Smith and Rufus Edwards Household Energy and Health Programme, Shell Foundation dated January 2007. http://www.pciaonline.org/files/KPT_Version_3.0_0.pdf
/P24/	Population pressure and deforestation in India. S.C. Gulati and Suresh Sharma. Population Research Centre, Institute of Economic Growth, University Enclave, Delhi.(Page no 10 and 11). Source of evidence for showing the decrease in forest cover and use of non-renewable biomass since 1989.
/P25/	Environmental implications of the energy ladder in rural India and Environmental impacts of increased usage http://www.hedon.info/BP42_EnvironmentalImplicationsOfTheEnergyLadderInRuralIndia
/P26/	Oases of Rayalaseema: SPWD's Tank Restoration Program in Southern Andhra Pradesh, India ftp://ftp.solutionexchange.net.in/public/wes/cr/res-15061003.pdf
/P27/	http://en.wikipedia.org/wiki/Chittoor
/P28/	http://apsham.ap.nic.in/Agri_Climatic_Zones.html#7
/P29/	Geospatial Mapping of Bioenergy Potential in Karnataka, India. Journal of Energy & Environment, Ramachandra, T.V, Vol 6, May 2007 (Page no 35) http://www.buet.ac.bd/ces/ramachandra.pdf
/P30/	Sustainable Exploitation, Cultivation and Marketing Linkages of Non-Timber Forest Products (NTFPs) in Andhra Pradesh(Pg.20) http://forest.ap.nic.in/JFM%20CFM/CFM/Special%20Reports/NTFPs%20in%20AP%20%20by%20TE%20RI/NTFP%20Final%20Report%20July-04.pdf

/P31/	<p>Stakeholder consultation report dated 2012-01-09, Conducted at Hindu Muslim Kalyana Mandapam, Karvetinagaram, Chittoor District, Andhra Pradesh between 11:30 A.M to 1.00 P.M in local language. The agenda of the meeting are listed below,</p> <ul style="list-style-type: none"> ✓ Opening of the Meeting ✓ Explanation of the biogas project activity ✓ Questions for clarification about project explanation ✓ Completing sustainable development checklists ✓ Discussion on monitoring sustainable development parameters <p>Closure of the meeting</p>
/P32/	<ol style="list-style-type: none"> 1) Invitation informing Local Stake Holders, Government officials and policy makers, Local and International NGO's about the stakeholder meeting through emails, postal, hand and displays. 2) Advertisement in the local newspapers "Andhra Prabha" announcing the stakeholder Meeting for Biogas CDM Project of CROSS on 2012-01-08. 3) Evaluation forms, Outcome of consultation process, Assessment of received comments dated 2012-01-09. 4) Minutes of the Stakeholder Meeting and Photographs along with the attendance sheet dated 2012-01-09.
/P33/	Copy of extracts of board resolution dated 2011-06-30, decision to proceed with the proposed CDM project.

Background investigation and other referred documents/websites:

Ref no.	Document/Web links
/B01/	http://www.ipcc-nggip.iges.or.jp/
/B02/	http://www.cross.org.in/
/B03/	http://pubs.iied.org/pdfs/G02989.pdf
/B04/	http://chittoor.nic.in/
/B05/	http://www.mnre.gov.in/schemes/decentralized-systems/schems-2
/B06/	http://www.getlatlon.com/
/B07/	http://transition.fcc.gov/mb/audio/bickel/DDDMSS-decimal.html
/B08/	http://mospi.nic.in/rept%20%20pubn/ftest.asp?rept_id=442&type=NSSO (1997) http://mospi.nic.in/rept%20%20pubn/ftest.asp?rept_id=448&type=NSSO (1998) http://mospi.nic.in/rept%20%20pubn/ftest.asp?rept_id=454&type=NSSO (1999-2000) http://mospi.nic.in/rept%20%20pubn/ftest.asp?rept_id=476&type=NSSO (2000-01) http://mospi.nic.in/rept%20%20pubn/ftest.asp?rept_id=484&type=NSSO (2002) http://mospi.nic.in/rept%20%20pubn/ftest.asp?rept_id=490&type=NSSO (2003) http://mospi.nic.in/rept%20%20pubn/ftest.asp?rept_id=509_P1&type=NSSO (2004-05) http://mospi.nic.in/rept%20%20pubn/ftest.asp?rept_id=523&type=NSSO (2005-06) http://mospi.nic.in/rept%20%20pubn/ftest.asp?rept_id=527&type=nssso (2006-07) http://mospi.nic.in/Mospi_New/upload/530_final.pdf (2007-08)
/B09/	http://www.hedon.info/BP42_EnvironmentalImplicationsOfTheEnergyLadderInRuralIndia
/B10/	http://apsham.ap.nic.in/Agri_Climatic_Zones.html#7
/B11/	CDM Validation and Verification Manual (Version 01.2)
/B12/	<ol style="list-style-type: none"> 1) CDM-SSC-PDD - Project Design Document form for Small-Scale project activities, Version 03 http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html 2) UNFCCC: Guidelines for completing CDM-SSC-PDD and CDM-NM, version 05 dated 2007-09-14 http://cdm.unfccc.int/Reference/Guidclarif/pdd/index.html
/B13/	<p>Approved Baseline & Monitoring Methodology:</p> <ol style="list-style-type: none"> I. AMS-IE., Version 04 "Switch from Non-Renewable Biomass for Thermal Applications by the User" valid from 2011-04-29 and request for registration can be submitted until 2013-04-03 23:59:59 GMT http://cdm.unfccc.int/methodologies/DB/WHTQUFLWCVNB9CIUZC198A712W_GQR4
/B14/	http://cdmindia.in/approval_process.php

/B15/	Glossary of CDM terms version 7.0 (http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf)
/B16/	Kyoto Protocol (1997)
/B17/	Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7)
/B18/	Guidelines for the demonstration and assessment of prior consideration of the CDM (version 04) – EB 62, Annex 13 (http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid04.pdf)
/B19/	Guidelines for demonstrating additionality of micro scale project activities, EB68, Annex 26 (http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid22.pdf)
/B20/	1) Registration- Completeness check 2) Registration- Reporting Requirement Check - EB 48-Annex 60 (http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid05.pdf)
/B21/	General Guidelines to SSC CDM methodologies, Version 17, EB 61- Annex 21 (http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf)
/B22/	http://www.satsig.net/maps/lat-long-finder.htm
/B23/	http://www.mnre.gov.in/
/B24/	http://en.wikipedia.org/wiki/Chittoor
/B25/	http://moef.nic.in/legis/eia/so1533.pdf
/B26/	http://www.fairclimate.com/tech/team/
/B27/	http://www.hedon.info/BP42_EnvironmentalImplicationsOfTheEnergyLadderInRuralIndia
/B28/	Guidelines on Assessment of Debundling for SSC Project Activities, EB 54, Annex 13, version 03(http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid17.pdf)
/B29/	http://www.fao.org/sd/EGdirect/EGre0022.htm
/B30/	Guidelines for sampling and surveys for CDM project activities and programme of activities, EB 69 Annex 05 (http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid48.pdf) Note: Formerly known as Best practice examples focusing on sample size and reliability calculations,

2.2. Follow-up Interviews with Project Stakeholders:

TÜV Rheinland validation team carried out an on-site visit dated (2012-06-11) and performed interviews with the project representatives and stakeholders.

Prior to the interview salient points to be discussed were planned. Date of interview, interviewee and points discussed are given in the following table.

	Date	Name	Organization	Topic
/I-01/	2012-06-11	Mr. Puvvani Bhupathi	Director, CROSS	CROSS foundation history, office location, members role and responsibilities, focal point for the proposed CDM project, HCA progress, MOC signing authorization, CER sharing agreement copy, plan of implementation of the project in 4 Mandals of Chittoor, CER allocation / ownership, Baseline study assumptions, Monitoring and measurement equipment and system, Sustainable

				development issues, stakeholder consultation process, ODA source if any Discussion on baseline survey, Operation of TRISTLE software, database management, field visit co-ordination, basics of CDM, monitoring of the project activity.
/I-02/	2012-06-11	Dr. Sudha Padmanabha	Consultant, Fair Climate Network	Technical details of the project realization, project feasibility, designing, operational life time, monitoring of the project, Host Government Approval, Approval procedures and status, Financial aspects for funding the project, Crediting period, Project activity starting date, Additionality, Editorial issues of the PDD, Roles & responsibilities of the project participants w.r.t. project management, monitoring and reporting.
	2012-06-11	Mr. Chetan	Consultant, Fair Climate Network	
/I-03/	2012-06-11	Chandraiah	Stakeholders, Athamakuru G.D Nellore	DOE has prepared a set of questionnaires which has basic details of village name, taluk name, interviewed person, No of person in house, type and number of animal, baseline manure management practice, type of cooking fuel, no of head loads, type of stoves for cooking the fuel, time spent on fuel wood collection and daily cooking, fuel purchase cost, animal grazing time, handling of sludge and interest in the project activity.
		Jayalakshmi		
		Vadivelu		
		Pradeep		
		Sankaraiah		
		Bhuvaneswari		
		Lalithamma		
		Tulasi		
		Ajni Boyudu		
		Parameswara reddy		
		Venkatesh		
		Jaipal	Stakeholders Aggichenupalli Vedurukuppam	DOE has prepared a set of questionnaires which has basic details of village name, taluk name, interviewed person, No of person in house, type and number of animal, baseline manure management practice, type of cooking fuel, no of head loads, type of stoves for cooking the fuel, time spent on fuel wood collection and daily cooking, fuel purchase cost, animal grazing time, handling of sludge and interest in the project activity.
		Parasuramaiah		
		Seenaiah		
		Narayanaswami		
		Rajyalakshmi		
		Gopal		
		Lakshmidevi		
	2012-06-11	Anusuya	Stakeholders	DOE has prepared a set of questionnaires which has basic
		Devamma		

		Jyoti	D.M Puram Karveti Nagaram	details of village name, taluk name, interviewed person, No of person in house, type and number of animal, baseline manure management practice, type of cooking fuel, no of head loads, type of stoves for cooking the fuel, time spent on fuel wood collection and daily cooking, fuel purchase cost, animal grazing time, handling of sludge and interest in the project activity.
		Chittamma		
		Muruges		
		Eswari		
		Janakamma		
		Yashodamma		
	2012-06-11	Janakiram	Stakeholders, Muddikuppam S.R Puram	DOE has prepared a set of questionnaires which has basic details of village name, taluk name, interviewed person, No of person in house, type and number of animal, baseline manure management practice, type of cooking fuel, no of head loads, type of stoves for cooking the fuel, time spent on fuel wood collection and daily cooking, fuel purchase cost, animal grazing time, handling of sludge and interest in the project activity.
		Ramaraju		
		Gangamma		
		Savitramma		
		Saraswathi		
		Suresh		
		Kirankumar		
		Sandhya		
		Jayamma		

Validation Team considered the views obtained in these interviews while arriving at Validation Opinion.

2.3 Resolution of Outstanding Issues:

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to TÜV Rheinland's positive conclusion on the project design. In order to ensure transparency a validation protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

It organises, details and clarifies the requirements a CDM project is expected to meet;

It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for this project is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

Mistakes have been made with a direct influence on project results;

CDM and/or methodology specific requirements have not been met; or

There is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

Validation Protocol Table 1: Validation requirements				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various UNFCCC requirements as specified in the VVM are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the VVM.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 2: List of Requests for Corrective Action (CAR) and Clarification (CL)			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

Table 3: List of forward action requests (FARs)			
FAR number	Reference	Summary of project owner response	Validation team conclusion
Forward action request (FAR) to be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

Figure 1. Validation protocol tables

2.4 Internal Quality Control:

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent a technical review by a qualified independent reviewer before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification that meets the criteria of EB guidelines for qualification.

2.5 Validation Team:

Before the assessment begins, members of the validation team are ensured to cover the technical area(s), sectoral scope(s) and relevant host country experience including local language ability for evaluating the CDM project activity. The qualification of the team is as per the criterias defined by the EB guidelines for qualification.

Validation Team			Type of Involvement						
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Supervising the work	Desk review	Site Visit + Interview	Report and protocol Writing	Technical Expert Input	Reporting Support	Technical Reviewer
R. Murali	India	1.2, 3.1	X	X	X	X	X		
Ma. Paa. Puratchikkanal	India	1.2, 3.1, 6.1, 13.1, 13.2, 15.1		X	X		X	X	
Nagaraju Bellapu	India	1.2, 3.1						X	
Indumathi C	India	1.2							X

2. Validation Findings:

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

3.1 Approval and Participation

Community Reconstruction of Social Service (CROSS) is the Project Participant for the "Micro Scale Biogas CDM Project of CROSS" CDM project activity. The current CDM project has received letter of approval reference number 4/12/2012-CCC dated 2012-08-16/P03/, soft copy has been received from the PP is verified. The name of the project proponent is consistent throughout the PDD, under A.3 and Annex 1/P02/. The LoA issued by the DNA of India, MoEF mentions the same name as the project participant and has the same project title.

The title of the project presented to host country DNA is same as the title provided in the webhosted and the current final version of PDD. The Mandal and district in which the project has been located is shown as G.D.Nellore, S.R Puram, Vedurukuppam, Karvetinagaram mandals in Chittoor District/B04/ of Andhra Pradesh, India. It was confirmed from Letter of approval/P03/ which was forwarded by the PP mentioning about the approval status of the project, thus the authenticity of the LoA is verified by the DOE.

The letter of approval mentions about the voluntary participation by CROSS and also mentions that India has ratified the Kyoto Protocol in August 2002 and the project complies with the host country sustainable development criteria. TRC reviewed the sustainable development defined by India¹. The introduction of biogas units in the project area will reduce the dependence on non-renewable biomass which is the main fuel used for cooking and heating. The implementation of the biogas units will also improve the indoor quality as the biogas stoves will replace traditional firewood stoves. On the whole, the quality of life in the region is expected to improve and women need not travel long distances for collecting the firewood. The sludge from the biogas

¹ http://envfor.nic.in/divisions/ccd/cdm_iac.html

digester can be used as a fertilizer in the agricultural fields which was confirmed from interviewed stakeholders during the site visit. The project overall creates many environmental and social benefits, and improved lifestyle for rural women as the organization is focused on Women's empowerment/B02/. The host country has accorded approval to the project; the approval letter states that the project contributes to sustainable development. The sustainability such as environment, economic, social and technology is the main indicator defined by the Indian DNA. Thus the host party has confirmed the contribution of the project activity to the sustainability development

The project is the installation of bio-digester to produce bio-gas which is mainly used for cooking and heating needs of the households. The main GHG gases considered under the project activity is only CO₂. Thus the project contributes to climate change mitigation efforts in a significant, continuous, real and lasting manner.

However CAR-A1 was raised and closed successfully.

The below table summarizes the project participants and parties involved. The authenticity of the letters of approval has been validated by TÜV Rheinland validation team.

These LoA/P03/ are therefore regarded as valid and meeting the requirements.

Project participants	<i>Community Reconstruction of Social Service (CROSS)</i>
Parties involved	<i>India</i>
Approval	
LoA received	<i>Yes</i>
Date of LoA	<i>2012-08-16</i>
Reference to document	<i>4/12/2012-CCC</i>
LoA received from	<i>CROSS/FCN</i>
Validation of authenticity	<i>The HCA submitted as a soft copy through e-mail has been cross verified with the original copy. An email confirmation from the NCDMA personal which is CC to Assistant. NCDMA (Indian DNA e-mail) forwarded by the PP w.r.t Approval of HCA for the proposed CDM project is also verified to check the authenticity of the HCA/P23/. Thus the LoA submitted by CROSS/FCN is valid.</i>
Validity of LoA	<i>Valid</i>
Participation	
Party is party to Kyoto Protocol	<i>India ratified Kyoto protocol in August 2002</i>
Voluntary participation	<i>Yes</i>
Diversion of official development aid towards host country	<i>No/P05/, the project will be funded by forward carbon finance once registered with UNFCCC as a CDM project.</i>
Project contribution to SD	<i>Yes, the project is a community based project and all the sustainable criterion has been mentioned in HCA and in line with the host country requirements.</i>

The validation team confirms that the information related to the letter of approval as mentioned in the above table is authentic and is in line with 45 to 54 of VVM (Version 1.2).

3.1.2 Modalities of Communications/P04/:

Requirement of MOC	Criteria fulfilled	Determination by the validation team
Is the focal point identified	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>Mr. Puvvani Bhupathi /I-01/ Director of CROSS has been identified as the focal point. MOC /P21/ and HCA/P03/ have been verified for the same.</i>
Is the MOC signed by all project participant (including focal point identified entity/personal)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>Community Reconstruction of Social Service (CROSS) is the only project participant and the identified focal point. Mr. Puvvani Bhupathi is the person responsible for signing</i>

		<i>and further communication with EB/UNFCCC.</i>
Is the written confirmation obtained by the PP's stating the authorization, specimen signatures and personal details, employment status are valid and accurate?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>During the site visit, the validation team interviewed Mr. Puvvani Bhupathi at their NGO office /I-01/. The employment status and personal details are verified by interview. Thus the DOE confirms that the personal details, employment status are valid and accurate.</i>
Is MOC received by the validation team from the PP with whom DOE has the contractual relationship?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>Yes, the MOC received by the DOE from CROSS with whom TRC has contracted for validation services.</i>

The validation team confirms that the applicable latest template (http://cdm.unfccc.int/Reference/PDDs_Forms/Registration/reg_form04_v01.doc) is been employed by the project participant for the MOC. The MOC is been received from the DOE's contractual project participant. All the personal who have duly signed the MOC are been confirmed from the written communication by the project proponent regarding their personal identity, specimen signatures and employment status/I-01/.

3.2 Project Design Document:

Webhosted PDD and all version of the PDD have been presented in the prescribed format Clean Development Mechanism Project Design Document Form (CDM-SSC-PDD)/B12/, Version 03, in effect as of 2006-12-22 and deadline for submission is till 2013-01-31(http://cdm.unfccc.int/Reference/Notes/reg/reg_note43.pdf). The template has not been altered and no modifications have been made to the font, format, headings and logo.

The PDD follows the contents provided under the "Guidelines for completing the simplified Project Design Document (CDM-SSC-PDD)", Version 5, dated 2007-09-14 EB 34, Annex 09/B12/, and the directions contained under Section B (Pages 6/24 to 16/24) of the above guidelines.

CL-04 is raised and closed successfully.

3.3 Project Description:

The project activity is the installation of 5000 house hold biogas units and stoves within the project area of four mandals mandals of G.D Nellore, S.R Puram, Vedurukuppam and Karvetinagaram of Chittoor district of Andhra Pradesh, India. The biogas units will be fed by cattle dung generated from the households. The biogas stoves will replace the traditional fire wood stoves used for cooking and heating purposes. Section A.2 of the PDD contains a clear description of the project activity. The project technology is explained in a detailed manner in section A.4 of the PDD. The biogas model used in the project is the Deenabandhu model approved by the Ministry of New and Renewable Energy (MNRE)/B05/. The technology involves the construction of foundation, dome, Biogas outlet pipe, inlet mixer tank and outlet tank into which the animal manure mixed with water for the production of biogas. Through a series of biochemical reactions, the organic matter is broken down by mesophilic microorganisms to release biogas, of which methane is the major component. The biogas is released into the pipes connected to the stoves when the stove burner is switched on. The technology to be employed is environmentally safe and sound. The project plans phase wise implementation. After successful registration of the project, the PP plans to implement 700 biogas units in the first year, 1400 units in the second year, 1400 units in the third year and remaining 1500 units in the fourth year/I-01/.

CAR-02 is raised and closed successfully.

Project location

The project activity comprises bio-digesters of capacities 2m³ in the District of Chittoor, Andhra Pradesh, India. The four mandals included in the project activity are G.D Nellore, S.R Puram, Vedurukuppam and Karvetinagaram /B04/. This is the first CDM bio-digesters in the project area and is not included in any other CDM project. The geographical coordinate /B06/, /B07/, /B22/ of the project is mentioned below

State	District	Mandals	Latitude (N)	Longitude (E)
Andhra Pradesh	Chittoor	G.D.Nellore	13°13'1"	79°11'52"
		S.R Puram	13°27'45"	79°20'49"

		Vedurukuppam	13°26'13"	79°19'33"
		Karvetinagaram	13°24'3"	79°27'0"

The project will start implementation after the successful registration with UNFCCC as a CDM project. The capacity and the model to be used in the project activity are approved by MNRE/B05/. The consultant FCN/B26/ has hands on experience in similar bio-digester project (Ref: UNFCCC no 0121²) and who supports the PP (CROSS) during the implementation, commissioning and successful monitoring of the project activity.

The project has chosen renewable crediting period and the same has been given clearly in the PDD. Considering the life time of the project activity, the chosen renewable crediting period is appropriate. The crediting period starting date has been chosen as 2014-01-01 considering the date of registration and targeted phase-I implementation of 700 biogas units. The date given in the PDD is appropriate and unambiguous.

The lifetime of a fixed dome biogas unit includes Deenabandhu model as per Food and Agricultural Organization was reviewed; wherein the operating lifetime of a biogas unit is given as 20 to 50 years/B29/. In addition the DOE has reviewed life time based on the AFPRO report which mention the life time as 25 years or more/P11/. Hence the assumed life time of 25 years considered for the proposed Deenabandhu model bio digester is valid and correct.

Based on the discussion with the FCN and CROSS/I-01/, /I-02/ and information available in public domain, the project can be implemented as planned in the project description. The technology is proven in Indian conditions and approved by MNRE/B05/.

As per the clarification from EB regarding de-bundling in EB 54, Annex 13 para 7 (d), "Guidelines on assessment of de-bundling for SSC project activities" the household bio-digester project are not considered to be a de-bundled component of large scale CDM project activity unless the individual energy device output is within 1% of the maximum threshold limit given by the methodology. The debundling check has been assessed according to the EB guidelines.

Project Case:

The current CDM project activity involving independent subsystem/measures, considering the maximum bio-digester capacity of 2m³ and biogas stove with burner capacity of 4 inch with a maximum flow rate of 0.47m³/hr per stove/P20/. Thus the total usage of biogas stove per day will be 4.2 hours/P08/. After applying the values of combustion efficiency of the burner, heat of combustion per unit volume and capacity of the bio-digester, the maximum energy available from the heating device or biogas stove per house hold is worked out to be 1.69 kW_{th} or 0.00169 MW_{th} which is less than 1% (i.e., 0.45 MW_{th}) of the maximum threshold limit of applied small scale methodology of AMS.I-E which is 45 MW_{th} which is in line para 7 (d). Thus as per EB 54, Annex 13, the project is exempted from de-bundling component of large scale project. CL-02 is raised and closed successfully.

Starting date of project	Expected project operational lifetime	Crediting period
2013-04-01 is considered as the expected start date of the project activity (expected start date of construction)	25 years/B29/, /P11/	7 years

Herewith, the Validation Team summarizes major changes between webhosted PDD and final version of PDD for submission as follows

Subject	Webhosted PDD/P01/	Correction to webhosted PDD in the final PDD submission/P02/ for registration with DOE assessment and reason of acceptance
PDD (project title / participants involved/ project	Project Title: Micro Scale Biogas CDM Project of CROSS Project participant: Community Reconstruction of	Project Title: No change Project participant: No change Technology: No Change

² <http://cdm.unfccc.int/Projects/DB/DNV-CUK1131002343.1/view>

location /project technology etc)	<p>Social Service (CROSS) Technology: Biogas Digester of capacity 2m³ Implementation: After registration Model: Not mentioned. Version: 01 Date: 2012-03-15</p>	<p>Implementation: After registration in 4 phases (Year 1 – 700 units, Year 2 – 1400 units Year 3 - 1400 units and Year 4- 1500 units) Model: Fixed dome Deenabandhu Version: 2.1 Date: 2012-12-06 Selection criterion for the implementation of bio-digester in households is included and the cattle dung as the raw material is maintained consistently throughout the final PDD. Technical specification table has been included.</p>
Methodologies and tools applied (scope and version numbers)	<p>Methodology (ies): 1.AMS-I.E., Version 04 “Switch from Non-Renewable Biomass for Thermal Applications by the User” valid from 2011-04-29 and request for registration can be submitted until 2013-04-03 23:59:59 GMT</p>	<p>No changes in the methodology. However during validation stage AMS-I.E, version 05 has been released which is valid from 03 August 2012. However version 04 of AMS-I.E can be submitted for registration until 03 April 2013 23:59:59 GMT.</p>
CER calculations (formula applied/ amount of emission reduction)	<p><i>For AMS-I.E (Baseline Emission from NRB component),</i> $ER_y = B_y * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$ Energy available from the bio-digester = 1.73 kW_{th} Adult equivalent = 3.13 Annual consumption of biomass based on survey = 3.97 tonnes/ family/year $f_{NRB,y}$ - Fraction of NRB = 0.95 $ER_y = BE_y - PE_y - Leakage$ Annual emission reductions = 4.38 tCO_{2e}/family/year $ER_y = 16,456 \text{ tCO}_{2e}/\text{yr}$ (Annual average)</p>	<p>No changes in the formula applied. Energy available from the bio-digester = 1.69 kW_{th} No change in the Adult equivalent No change in annual consumption of biomass/per capita/day and the annual emission reduction from methane recovery of the bio-digester. Annual emission reductions = 4.38 tCO_{2e}/family/year $ER_y = 16,456 \text{ tCO}_{2e}/\text{yr}$ (Annual average)</p>
Additionality: (Benchmark / input values/analysis type/project start date/IRR or NPV values etc.)	<p>Project qualifies as a micro scale CDM project as per para 2 and para 4 of “Guidelines for demonstrating additionality of micro scale project activities” Version 03, EB 63, Annex 23.</p>	<p>No changes to the additionality arguments. However the updated guideline has been released in EB 68. Thus the PDD is also revised to include the latest “Guidelines for demonstrating additionality of micro scale project activities” Version 04, EB 68, Annex 26.</p>
Monitoring (parameters / frequency)	<p>Monitoring parameter are as follows, 1) Biogas unit constructed 2) Number of biogas unit in operation 3) Confirmation that non-renewable biomass has been substituted 4) Non-usage of biogas plants The sampling guideline referred is “Standard for sampling and surveys for CDM project activities and programme of activities” Version 01 EB 65,</p>	<p>Monitoring parameters after corrections, 1) Biogas unit constructed 2) Number of biogas unit in operation 3) Confirmation that non-renewable biomass has been substituted has been removed because the methodology has provided a</p>

	Annex 02	<p>default value which has been taken by the PP to calculate the same.</p> <p>4) Non-usage of biogas plants</p> <p>5) Included Average annual hours of operation of a system</p> <p>During the validation PP has included monitoring of non-usage of biogas plants as an ex-post monitoring parameter. Hence PP has included the detailed monitoring plan including the sampling plan using the “Guidelines for sampling and surveys for CDM project activities and programme of activities” Annex 05 EB 69 in Annex 4 of the revised PDD.</p>
Crediting period (type / start date)	7 years renewable crediting period with the expected crediting period start date as 2014-01-01	<p>No Change</p> <p>7 years renewable crediting period with the expected crediting period start date as 2014-01-01</p>

Please refer to Appendix A of this report for details of each change between webhosted PDD and the final PDD for submission. The Validation Team has carried out the validation process based on the Webhosted PDD and raised CARs/CLs against the project by issuing the validation protocol.

With the updated information and corrections done on final PDD, the PP has addressed all the CARs /CLs that were raised by the Validation Team.

It is concluded that the Validation Team has reviewed the project in line with the VVM (version 01.2) and all the evidence, corrections, justifications and updating done on the final PDD with respect to CARs /CLs raised are accepted and closed by the Validation Team, issuing the positive validation opinion for project registration. No FAR is raised during the validation.

TÜV Rheinland validation team considers the project description of the project contained in the PDD to be complete and accurate. The PDD complies with the relevant methodology, tools, forms and guidance at the time of PDD submission for registration.

3.4 Baseline and Monitoring Methodology:

3.4.1 Applicability of the selected methodology to the project activity

Approved baseline and monitoring methodology AMS I.E “Switch from non-renewable biomass for thermal applications by the user” (version 04) has been applied for the proposed project activity. At the time of GSP of the PDD (version 01, dated 2012-03-15) and methodology (AMS I.E) version 04 applied was the latest one. The version 04 is applicable, if requests for registration for the project can be submitted until 2013-04-03, 23:59 GMT.

The validation team determined the applicability of methodology AMS I.E (version 04) as follows:

Applicability criteria of the methodology AMS-I.E Version 04 valid till 2013-04-03 23:59:59/B13/	Criteria fulfilled	Determination by the validation team
This category comprises activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include but are not limited to biogas stoves, solar cookers, passive solar homes, renewable energy based drinking water treatment technologies (e.g. sand filters followed by solar water disinfection; water boiling using renewable biomass).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The project involves the installation of bio-digester and biogas stoves that replace the use of traditional stoves fuelled by non-renewable biomass. The usage of non-renewable biomass has been confirmed from the latest Forest Survey of India/P15/, Ministry of Environment and Forests, Government of India and this account for an f_{NRB} of 0.95 in the project area. Also the NSSO report 2010 supports the usage of fuel wood and chips for cooking needs in rural areas of Andhra Pradesh which accounts

Applicability criteria of the methodology AMS-IE Version 04 valid till 2013-04-03 23:59:59/B13/	Criteria fulfilled	Determination by the validation team
		to 80.6% of total fuel usage/P17/. A baseline survey has been conducted in G.D.Nellore, S.R Puram, Vedurukuppam and Karvetinagaram to further confirm the usage of non-renewable biomass/P07/. Based on the interview with stakeholder/I-01, /I-03/ during the validation site visit and all the above reviewed documents the DOE concludes that the project activity would replace the non-renewable biomass with the installation of biogas-digesters in the project area. Hence this particular applicability condition is satisfied.
Project participants are able to show that non-renewable biomass has been used since 1989-12-31, using survey methods or referring to published literature, official reports or statistics.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>Project proponent has adequately justified in the PDD that non-renewable biomass has been used since 1989-12-31.</p> <p>The published literature and Satellite imaginaries are reviewed for the assessment. The same is presented below,</p> <ol style="list-style-type: none"> 1) From the review of the literature "Population pressure and deforestation in India. S.C. Gulati and Suresh Sharma"/P24/ there has been a decrease of 10% change in the crown cover in Andhra Pradesh during the period 1989-1997 which proves that the non-renewable biomass has been used since 1989. 2) It can be evidenced from the State of Forest Report, 1989, Forest Survey of India, Ministry of Environment and Forests, Government of India. (page no 15) /P14/, Andhra Pradesh has a forest cover of 0.05 -0.1 ha/capita which is well below the minimum per capita forest requirement of 0.47 ha/capita/P14/. 3) Based on the National Sample Survey Organization (NSSO)/P17/ report, it is evidenced that the expenditure on the fuel and lighting has increased steadily from the available data from 1997 to 2008. Thus the DOE concludes that there is an increase in fuel wood price which shows the scarcity in the project area. During the site visit/I-01/, /I-03/, the local stakeholders are interviewed and the same has been confirmed at field level by the DOE. 4) In addition, the usage of non-renewable biomass can be verified from the FSI data/P15/ on the consumption of fuel wood and found that the total consumption of fuel wood is about 24.293 Million Tonne

Applicability criteria of the methodology AMS-I-E Version 04 valid till 2013-04-03 23:59:59/B13/	Criteria fulfilled	Determination by the validation team
		<p>against the Demonstrable Renewable Biomass production of 0.104 Million Tonne. Hence it can be evidenced that the non-renewable biomass has been used since 1989-12-31 in the state of Andhra Pradesh</p> <p>Thus the applicability conditions are met for the project activity.</p> <p>CAR-03 is raised and closed successfully</p>

The project applies the approved methodologies AMS I.E which displace non-renewable biomass. Thus the DOE has confirmed that the proposed project activity falls under Type-I category as per the Glossary of CDM Terms/B15/, Version 07, May 2012, pg no 52.

Threshold limit of Type-I project:

The maximum energy available from the heating device or biogas stove per house hold is worked out to be 1.69 kW_{th} or 0.00169 MW_{th} and the aggregated value for 5000 biogas units is 8.46 MW_{th}. Thus, the DOE concludes that the proposed project is within the maximum threshold limit of applied Type-I and small scale methodology of AMS.I-E which is 45 MW_{th}. The calculation to arrive at the energy available is verified from 'Biogas technology' by B.T.Nijaguna/P20/. Parameters such as efficiency of burner, heat of combustion per unit volume of biogas, volume of the digester, unit conversion factor are found to be valid and correct. Thus the project is well within the threshold limit.

The assessment of the project's compliance with the applicability criteria of the methodology AMS I.E (version 04) as documented in the PDD part B and annex 3, which are evaluated in detail under the validation protocol in Appendix A to this report based from the webhosted PDD.

3.4.2 Project Boundary:

The project boundary considered in the project activity is the physical, geographical site of the use of biomass or the renewable energy (Biogas stoves) which is in line with version 04 of the methodology. It was confirmed during the site visit/I-03/ and interview with the stakeholders that the installation of biogas stove will replace the usage of non-renewable biomass which improves the standard of living in the proposed project area and the project doesn't involve any transfer of project equipment from or to the project activity. Thus there is no leakage considered for the proposed CDM project other than the 'Diversion of non-renewable biomass saved under the project activity by non-project households'/B13/. Hence the DOE concludes that the proposed project satisfies the requirement of para 3 of AMS-I.E, version 04.

The GHG gases included are only CO₂, which is in line with the applied methodologies. No GHGs other than the identified source and sink have an impact on the project activity. Thus, there is no need for a clarification or revision or deviation from the approved methodology applied in the proposed project activity.

The geographical and physical project boundary of the project activity was determined by the validation team during the on-site assessment. The coordinates/B06/, /B07/, /B22/ were correctly documented in the PDD. The sources and sinks of greenhouse gas identified in the PDD are deemed to be appropriate.

Emissions	GHGs involved	Description
Baseline emissions	CO ₂	CO ₂ emissions from usage of non-renewable biomass at the project area.
Leakage	CO ₂	CO ₂ emissions from use of non-renewable wood by non-project household/users that previously used renewable energy. B _y can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required has been considered for the project activity./B13/

In summary, the project boundary was correctly identified in accordance with the methodology AMS I.E (version 04). All greenhouse gas emissions occurring within the proposed project activity boundary as a result of the implementation of the proposed CDM project activity have been appropriately addressed in the PDD. The identified project boundary and selected sources of emissions are justified for the project activity. The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, with respect to the methodology applied.

3.4.3 Baseline Identification:

The identified baseline for the project activity is the usage of Non-renewable biomass for the needs of cooking and heating the water.

According to the paragraph 2 of the methodology Project proponent shall show that non-renewable biomass has been used since 31 December 1989, using either survey methods or referring to published literature, official reports or statistics.

The project proponent has conducted a demographic survey for 5550 households in 320 villages belonging to 100 Gram Panchayats encompassing 4 Mandals of Chittoor District where the project is proposed to be implemented /P07/. The demographic survey was conducted to assess the features of target population. The demographic survey results details of family level, farm land details, Adult equivalent, type of live stock and its population, and energy use pattern of families for cooking, water heating and lighting. It is concluded by the DOE that for a larger sample size, the standard error is lower and precision levels are higher. Further to the demographic survey a random sample survey was conducted by the project participant for 228 households in 4 mandals to assess the quantity of fuel wood consumption for cooking and heating and grazing time of animals to determine the percentage of manure collected. The results of the survey clearly depict that in the absence of the project, the use of non-renewable biomass and little amount of fossil fuel (kerosene) is most prevalent in the project area. The survey results also reflect the use of biomass as the preferred trend in Chittoor region. Though kerosene is distributed through the PDS, the amount is negligible compared to that required for an average household. LPG is rarely used as it is unaffordable by most of the rural households and not reliable as the infrastructure for procuring the gas is not present in the project areas. However, kerosene is used as an accelerant and added to the firewood. The demographic survey conducted is conclusive and has been conducted with a 90/10 confidence/precision level as per 'Guidelines for sampling and surveys for CDM project activities and programme of activities' EB 69 Annex 05 guidelines/B30/.

The baseline survey database and results were verified and found to be transparent, reproducible, result-oriented, and in line with the EB guidelines for sampling and surveys.

A clear description and methods for the selection of baseline has been provided in Annex 4 of the PDD that would take place in the absence of the project activity. Without the bio-digester, the households in the project area would continue to use fossil fuel and/or fuel wood for thermal needs. The baseline identified is in line with the applicable methodology, AMS-I.E, version 04.

The description of the baseline is verifiable and transparent as the baseline is determined by the survey data, and supported by published scientific literature. TRC has reviewed the supporting literature which is available

publicly. Of the list, the baseline identification is evidenced by three published studies. The assessment of each is given below

The description of the baseline is verifiable and transparent as the baseline is determined by the survey data, and supported by published scientific literature. TRC has reviewed the supporting literature which is available publicly. Of the list, the baseline identification is evidenced by three published studies. The assessment of each is given below:

- 1) The studies on NRB and biomass trends from Forest Survey of India/P09/, Ministry of Environment and Forests, Government of India is analyzed for the state of Andhra Pradesh since there is no specific information available for Chittoor region. The data source has been assessed to find the demand of woody biomass against the availability in state of Andhra Pradesh. Thus according to the recent FSI 2011 study report/P15/, the total fuel wood consumption for Andhra Pradesh state is 24.293 Million Tonne against the fuel wood production from forests and from trees outside forests which account for 0.002 Million Tonne and 1.024 Million Tonne. Therefore the total fuel wood production of Demonstrable Renewable Biomass component is 1.026 Mt. Thus the Non-Renewable Biomass component of fuel wood consumption is 23.267 Million Tonne. This accounts for an f_{NRB} of 0.95 which supports the authenticity of the data collected during the baseline survey.
- 2) Secondly the baseline household survey conducted in 2011 for the project area showed that 100% of the respondents spend more time to collect fuel-wood now compared to that 20 years back. This is due to depletion of biomass stocks in wastelands and forests as the biomass (96% Non-renewable) is being used by the households. To further support the baseline survey A Participatory Rural Appraisal (PRA) study Community Driven Modeling of Social-Ecological Systems: Lessons from Andhra Pradesh, India/P16/, conducted in Chittoor district has been referred too. This study identified that fuel wood availability is a dynamic and very important problem in project area and the households need to trek longer distances to collect fuel-wood compared to that 20 years back resulting in increased time spent. The validation team thus confirms that as a result of the shortage of biomass in the region there is an increase in time spent for gathering fuel-wood by users and the biomass available and utilized as fuel is of non-renewable nature.
- 3) Thirdly, publicly available information on yearly consumer expenditure survey among Indian households carried out by the National Sample Survey Organization (NSSO) /P17/ for Andhra Pradesh is analyzed. The report provides information on energy sources used both for cooking and lighting together as a part of the survey. The survey results from 1997 to 2008 about the expenditure on fuel and lighting are analyzed and concluded that there is an increase in fuel cost. Based on the NSSO report 2010, it is concluded that 80.6% of energy for cooking is from fuel wood and chips in the state of Andhra Pradesh. Thus the increase of cost of fuel wood for cooking is increased beyond the inflation rate because of non-availability of resource which clearly shows the scarcity in the state.

Based on the baseline survey data and all the above publicly available evidences, the DOE concludes that the proposed project would continue to use non-renewable biomass in the project region without the project activity. From the baseline survey it was verified that the annual average firewood usage for cooking and other purposes per household or appliance is 3.97 t/appliance/yr/P07/ and has been conducted with a 95/5 confidence/precision level which is more conservative than that specified as per EB 69 Annex 05 guidelines/B30/.

The validation team confirms that the proposed project activity meets the above requirement. Therefore, the baseline scenario as prescribed in the AMS-IE version 04 is applicable to the proposed project activity. The validation took cognizance of § 105 of VVM (version 01.2).

The approved baseline methodology applicable to the	<input checked="" type="checkbox"/> Yes	All the applicability conditions are met as
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project explicit criteria implicit criteria (e.g. available scenarios, applicability of formulas for BE/PE/LE calculations)	<input type="checkbox"/> No	per AMS I.E. "Switch from non-renewable biomass for thermal applications by the user", version 04. Please refer Section 3.4.1 for details. Hence satisfied.
PDD includes all assumptions and data used by project participants	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	As required by the AMS-I.E., version 04, f_{NRB} is calculated from publicly available source FSI report. Quantity of Biomass that is substituted for 5,000 biogas units as per baseline survey conducted from 228 households, $NCV_{Biomass}$, $EF_{projected_fossilfuel}$ and Diversion of non-renewable biomass saved under the project activity by non-project households as per AMS-I.E. to calculate the baseline emission and emission reduction. The same has been verified in section B.6 of the PDD and emission reduction spread sheet. Hence satisfied.
All the references and documents used are relevant for establishing the baseline scenario	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	As required by the methodology of AMS-I.E., version 04 the baseline scenario are selected as per the requirements of the methodology. Please refer section 3.4.3 for the same.
All the references and documents used are correctly quoted and conservatively interpreted in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	As required by the methodology of AMS-I.E., version 04 the baseline scenario are selected as per the requirements of the methodology. Please refer section 3.4.3 for the same.
All relevant policies / regulations considered are listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	As per paragraph 4 and 5 of the AMS-I.E. version 04 the baseline has been identified and applied in the project activity. Please refer Section 3.4.1 for details. Hence satisfied.
Identified potential baseline scenarios reasonably represent what would/could occur in the absence of the proposed project activity	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The project avoids using of non-renewable biomass which is used for cooking & heating purposes in households by using the captured methane from the cow dung for the same purpose. This is the potential baseline scenario identified for the project activity. The identified baseline is in line with the applied methodology. Please refer section 3.4.3 for the same. Hence satisfied
The baseline scenario selection is appropriate and determined according to the methodology	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes, the baseline scenario is appropriate and determined according to the methodology. Please refer section 3.4.3 for the same. Hence satisfied.
The approved methodology used is applicable to the identified baseline scenario	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes, approved SSC methodology of AMS-I.E., version 04 is used. Hence satisfied.

Assessment on Baseline Survey:

The baseline survey conducted for the parameter is found to be unbiased and the estimates are reliable. The PP has followed Random sampling plan from the large demographic area with a 90/10 confidence/precision level to determine the sample size which is in line with the sampling guideline requirements. A simple random sampling was selected considering the homogenous nature of the project area where the occupation, altitude, temperature and cooking needs are similar which was confirmed during the site visit/I-01 to I-04/ and based on local expertise. Based on the formula the minimum sample size required to determine the baseline values should be 19 households and with a non- responsive rate of 80%, it scales up to 23 households. However the PP has conducted baseline survey for 228 households for robustness of values applied for the project activity. The DOE is of the opinion that the values derived for the baseline survey is valid. In addition, to determine value of fuel wood consumption, the lower bound value of 95/5 confidence/precision level has been applied which is more reliable. All the requirements for conducting a baseline survey are followed as outlined in sampling guideline. Thus the survey conducted by the PP is valid, unbiased, reliable and conservative.

The approved baseline methodology has been correctly applied to identify a realistic and credible baseline scenario, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

All the assumption and data used by the project participants are listed in the PDD and/or supporting documents. All documentation relevant for establishing the baseline scenario are correctly quoted and interpreted in the PDD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or Sectoral policies and circumstances are considered and listed in the PDD.

CAR-05 is raised and closed successfully.

3.4.4 GHG Emission Reductions:

The emission reduction calculations have been applied as per the applied methodology AMS I.E Version 04.

Baseline Emission:

Baseline emission reductions are the emission reductions occurred due to the usage of Non-renewable biomass for cooking and heating in the absence of the project activity. The following equation gives the amount of baseline emission reductions which is in line with the paragraph 5 of the AMS I.E version 04.

Equation 1 – AMS I.E version 04

$$ER_y = B_y * f_{NRB,y} * NCV_{\text{biomass}} * EF_{\text{projected_fossilfuel}}$$

Where

Parameters	Description	Source and appropriateness of parameters
ER_y	Emission reductions during the year y in tCO ₂ e	As per paragraph 5 of AMS-I.E, version 04
B_y	Quantity of woody biomass that is substituted or displaced in tons	<p>Based on Baseline Survey,</p> <ol style="list-style-type: none"> 1. The average per capita consumption of fuel wood at lower bound of 95/5 confidence/precision level usage is 3.97 tones /family/year/P07/ has been calculated based on the in-depth survey conducted in 228 households. A week data on fuel wood usage has been analyzed using sampling techniques to calculate the average per capita consumption of fuel wood. The field data are recorded based on the procedure laid in A guide for fuel wood surveys and 'Biomass Studies; Field Methods for Monitoring Biomass' (1997) by Shailaja Ravindranath and Sudha (1997)P' pg no 120 to 127/P19/. Hence the value applied is appropriate and is in line with para 5 of AMS-I.E, version 04. 2. The adult equivalent has been calculated based on the demographic survey/P07/ conducted in Chittoor region. The study follows the procedures as mentioned in Ramachandra 2007 Geospatial

		<p>Mapping of Bioenergy Potential in Karnataka, India. Journal of Energy & Environment, Volume 6, May 2007 to calculate adult equivalent /P29/and PCIA report pg no 17/P23/. Based on the survey results it is concluded that the adult equivalent/family in chittoor region is 3.13 adult equivalent/family. The resulted value is compared against the state level adult equivalent value of 5.34 adult equivalent/family as per NCAER/P12/, 2002, Evaluation survey of the National Programme on Improved Chulha, National Council of Applied Economic Research, Ministry of Non-Conventional Energy Sources, and Government of India for the state of Andhra Pradesh. Thus the value applied for adult equivalent is valid and conservative to calculate baseline emissions.</p>
$f_{NRB,y}$ $f_{NRB,y} = \frac{NRB}{NRB + DRB}$	<p>Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods</p> <p>NRB - Non-renewable biomass</p> <p>DRB – Demonstrable Renewable biomass</p>	<p>NRB :- Non-renewable Biomass is calculated based on the Consumption (in tons) - Production from forests and outside forests (in tons).</p> <p>DRB – Demonstrable renewable Biomass data is sourced from FSI report 2011, thus the Fuel wood production from forests and from trees outside Forests account given are 0.002 Million Tonne and 1.024 Million Tonne respectively. Therefore the total fuel wood production of DRB component is 1.026 Million Tonne.</p> <p>So $f_{NRB,y} = \frac{NRB}{NRB + DRB} = \frac{23.267}{(23.267+1.026)} = 0.95$</p> <p>All the above data from the State of Forest Report/P15/, Forest Survey of India, Ministry of Environment and Forests, Government of India, 2011 has been analyzed to calculate the NRB of the project area. The data is available state wise and values are assessed for Andhra Pradesh. According to the study report, the total fuel wood consumption for Andhra Pradesh state is 24.293 Million Tonne. Thus the NRB component of fuel wood consumption is 23.267 Million Tonne. This accounts for an f_{NRB} of 0.95. The DOE verifies the data provided by Ministry of</p>

		Environment and Forests and concludes that the data is valid and correct.
NCV_{biomass}	Net calorific value of the non-renewable woody biomass that is substituted	The value is taken from IPCC default for wood fuel - 0.015 TJ/tons. Hence it is in line with the para 5 of AMS-I.E/B13/, version 04. Hence valid.
$EF_{\text{projected_fossilfuel}}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers.	The value is taken as 81.6 tCO ₂ /TJ as per footnote 1, para 5 of AMS-I.E/B13/, version 04. Hence valid.

Project emissions:

As per Para 4 and 5 of AMS-I.E/B13/, there is no project emissions. Hence Project emissions are considered as zero.

Leakage:

As per para 10 (a) of AMS-I.E, version 04/B13/, the diversion of non-renewable biomass saved under the project activity by non-project households is considered as leakage. The PP has chosen a net to gross adjustment factor of 0.95 as per the methodology to account for leakages. The value is fixed for the first crediting period and thus no survey is required to monitor the parameter. In addition, the project doesn't involve any transfer of project equipment from or to the project activity.

Emission reduction:

Thus, $ER_y = BE_y - PE_y - \text{Leakage}$ has been calculated. The data not to be monitored are valid and correct. The values to be monitored for the ER calculation are plausible and explained further in section 5.2.7 of this report.

The estimated average annual ER is 16,456 tCO₂e/P08/.

In summary, the calculation of emission reductions was correctly demonstrated by the PP according to the methodology AMS I.E (version 04). The table below summaries validation team's determination of emission reduction:

All assumptions made for estimating GHG are listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	All the assumptions made for estimating GHG are listed in the PDD. Please refer section B.6 and Annex 3 of the final PDD. For detailed assessment of all the assumptions, please refer above Baseline emission, project emission and leakage in section 3.4.4.
All data used by project participants are listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	All the data required by AMS-I.E, version 04 is listed in the PDD. Please refer section B.6 and Annex 3 of the final PDD. For detailed assessment of each value listed in the PDD, please refer above Baseline emission, project emission and leakage in section 3.4.4.
Their references and sources are also listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	All the references are correctly referred in the PDD. The major references are from baseline survey results, IPCC default values and the default values mentioned in the methodology. Assumptions made for estimating GHG are listed in the PDD. Please refer section B.6 and Annex 3 of the final PDD. For detailed assessment and validity of the reference and sources, please refer above Baseline emission,

Formulas, parameters, values are complete, accurate, transparent and conservative	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	project emission and leakage in section 3.4.4. All the formulas, parameters, values are complete, accurate, transparent and conservative. Please refer section B.6 and Annex 3 of the final PDD. For detailed assessment please refer above Baseline emission, project emission and leakage in section 3.4.4.
All the references and documents used are correctly quoted and conservatively interpreted in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	All the references and documents used are correctly quoted and conservatively interpreted in section B.6 and Annex 3 of the final PDD. For detailed assessment please refer above Baseline
Methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and emission reductions	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Methodology AMS I.E version 04 is correctly referred and quoted in the PDD. Please refer section B.6 and Annex 3 of the final PDD. For detailed assessment please refer above Baseline emission, project emission and leakage in section 3.4.4.
All the emissions of baseline emissions can be replicated using information provided in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes, all the emissions of the baseline can be replicated using the information provided in the PDD. Please refer section B.6 and Annex 3 of the final PDD. For detailed assessment please refer above Baseline emission, project emission and leakage in section 3.4.4.

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average ex-ante estimation of emission reduction conservatively calculated to be 16,456 tCO₂e per year for the selected crediting period.

All assumptions and data used by the project participants and/or supporting documents, including their references and sources are listed in the PDD. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable and conservative in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

CAR-08 is raised and closed successfully

3.5 Additionality :

The project additionality is demonstrated based on the Micro-scale CDM project activities approach using the “Guidelines for demonstrating additionality of micro scale project activities” Version 04, EB 68, Annex 26. Based on the Type of the project activity the additionality has been assessed by the DOE. The proposed project applies the methodology, AMS-I.E, version 04. Accordingly the project activity falls under Type I category.

Type-I Applicability Condition (Para 2 of EB 68, Annex 26):

Project activities up to five megawatts³ that employ renewable energy technology⁴ are additional if any one of the conditions below is satisfied⁵:

- a) *The geographic location of the project activity is in one of the least developed countries or the small island developing States (LDCs/SIDS) or in a special underdeveloped zone (SUZ) of the host country;*

³ A positive list of technologies that are automatically defined as additional are included in “Guidelines on the demonstration of additionality of small-scale project activities” for which it is not required to satisfy the conditions indicated here (see EB 68, annex 27).

⁴ All technologies/measures included in approved Type I Small Scale CDM methodologies are eligible to be considered. Furthermore at its fifty-seventh meeting the Board clarified that all CDM project activities that meet the criteria specified in these guidelines are eligible to apply the guidelines irrespective of the scale of the approved CDM methodology applied to the project activity

⁵ Otherwise other means for demonstrating additionality shall be used (e.g. the tool “Tool for demonstration of additionality”, or “Guidelines on the demonstration of additionality of small-scale project activities

- i) *SUZ is a region in the host country (zone, municipality or any other designated official administrative unit) identified by the Government in official notifications for development assistance including for planning, management, and investment satisfying any one of the following conditions using most recent available data*
- *The proportion of population with income less than USD 2 per day (PPP)⁶ in the region is greater than 50%;*
 - *The GNI per capita in the country is less than USD 3000⁷ and the population of the region is among the poorest 20% in the poverty ranking of the host country as per the applicable national policies and procedures⁸*
- ii) *In cases where, based on the recommendation of the designated national authority of the host country⁹, the SUZ in the host country has been approved by Executive Board (hereinafter referred to as the Board) of the clean development mechanism (CDM), the list of such SUZ shall be maintained on the UNFCCC website (e.g. at <http://cdm.unfccc.int/DNA/submissions/index.html>). In the case of these SUZ listed on the CDM website there is no need for the project proponents to provide proofs as indicated in paragraph 2 (a) above¹⁰*
- b) *The project activity is an off-grid activity supplying energy to households/communities (less than 12 hours grid availability per 24 hrs is also considered “off-grid” for this assessment);*
- c) *The project activity is designed for distributed energy generation (not connected to a national or regional grid)¹¹ with both conditions (i) and (ii) satisfied;*
- i) *Each of the independent subsystems/measures in the project activity is smaller than or equal to 1500kW electrical installed capacity;*
 - ii) *End users of the subsystems or measures are households/communities/small and medium enterprises (SMEs)¹².*
- d) *The project activity employs specific renewable energy technologies/measures recommended by the host country designated national authority (DNA) and approved by the Board to be additional in the host country. The following conditions shall apply for DNA recommendations:*
- i) *Specific renewable energy technologies/measures refers to grid connected renewable energy technologies¹³ of installed capacity equal to or smaller than 5 MW;*
 - ii) *The ratio of installed capacity of the specific grid connected renewable energy technology in the total installed grid connected power generation capacity in the host country shall be equal to or less than 3 per cent¹⁴;*
 - iii) *Most recent available data on the percentage of contributions of specific renewable energy technologies shall be provided to demonstrate compliance with the 3 per cent threshold. In no case shall data older than three years from the date of submission be used*
 - iv) *Technologies/measures recommended by DNAs and approved by the Board to be additional in the host country remain valid for three years from the date of approval. However, additionality of eligible project activities applying the guidelines remains valid for the entire crediting period.*
 - v) *DNA submissions shall include the specific grid connected renewable electricity generation technologies that are being recommended and provide the required data as indicated above (e.g. wind power, biomass power, geothermal power, hydropower).*

⁶ Purchasing power parity.

⁷ PPP or the World Bank atlas method or another comparable

⁸ Information on per capita income or other economic indicators used for the ranking purposes shall be provided in USD.

⁹ DNA recommendations will be based on conditions indicated in paragraph 2(a)(i).

¹⁰ Forms and procedures for DNA recommendations shall be developed and made available at a later date.

¹¹ This means that projects applying AMS.I-D are not eligible. However project activities generating thermal energy such as solar water heaters displacing grid-connected electric heaters can apply paragraph 2(c).

¹² “communities” of consumers may for example include households, commercial facilities such as shops, public services/buildings and small, medium and micro enterprises (SMMs); Applications may include lighting (interior, public street lighting), electrical appliances such as refrigerators, agricultural water pumps”.

¹³ Renewable technologies that do not generate electricity, such as heating and cooling technologies, are not eligible

¹⁴ For example, if the ratio of total installed capacity of all grid-connected hydropower plants with the capacity equal to or smaller than 5 MW and the national grid-connected installed electricity generation capacity is less than 3 per cent in a host country then microscale hydropower is eligible for DNA recommendation in that host country

The following schematic diagram is used to prove micro scale additionality as per EB 68, Annex 26.

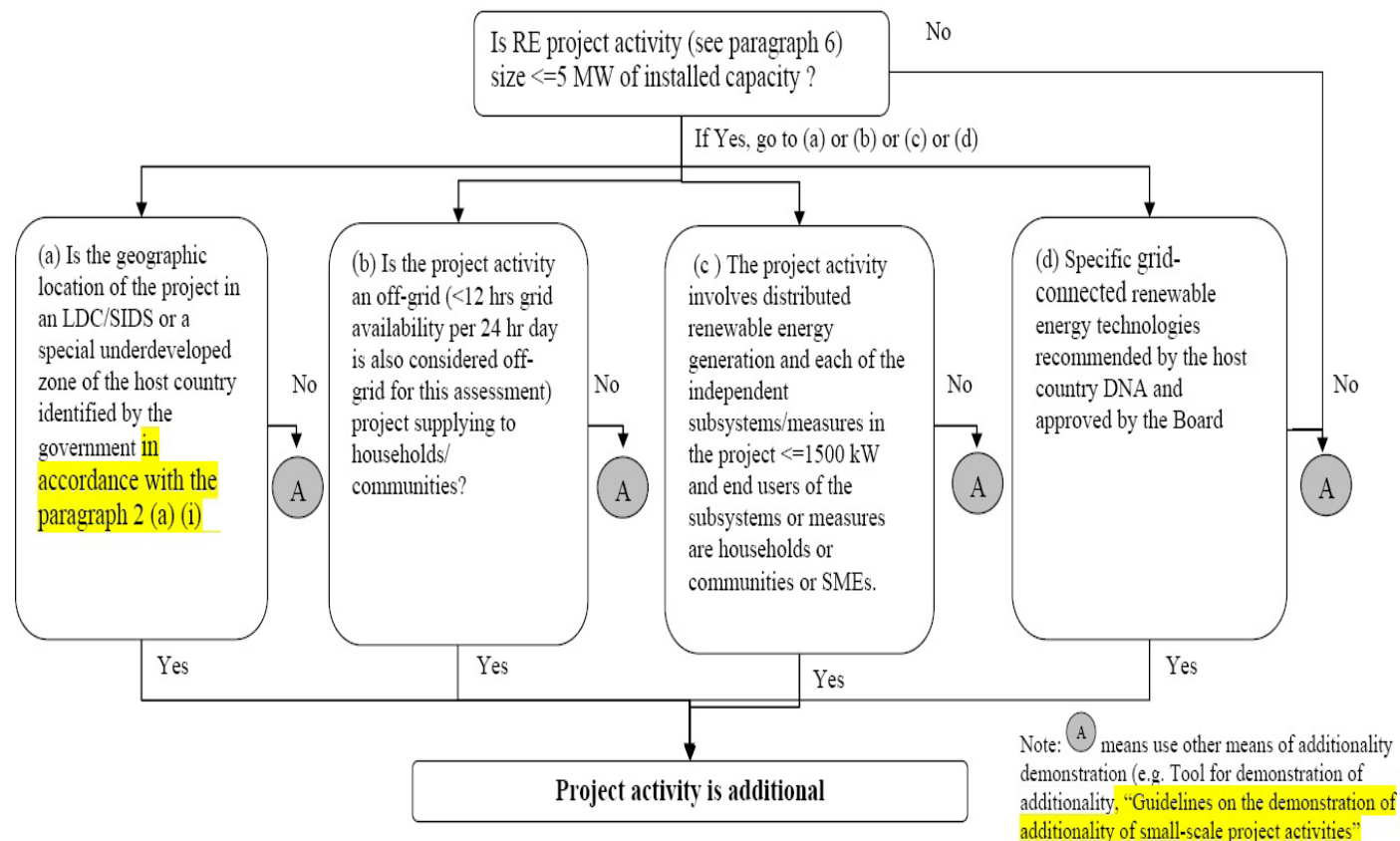


Figure 1: Microscale additionality test for RE project activities

Assessment on applicability of Micro-scale additionality (Type-I):

The proposed project activity plans to implement 5,000 biogas units of 2 m³ capacity. The project activity falls under Type I project activity, methodology I.E., which is renewable energy technology. Each biogas unit generates thermal energy of 1.69 kW_{th}. Thus 5,000 biogas units that will be constructed under the project activity will have an installed capacity of 8460 kW_{th} or 8.46 MW_{th}. This is less than 15 MW_{th}¹⁵. According to the guidelines for micro scale projects, definitions provided for output capacity and guidelines provided for conversion from electrical to thermal units in the most recent version of General Guidelines to SSC CDM methodologies shall be used. According to this guidelines, multiply by 3 to derive thermal units from electrical units irrespective of the type of project or methodology applied. The detailed calculation of the same has been provided below.

Parameter	Value	Unit	Source
Unit conversion rate	0.277777778	MJ to kWh	http://www.unitconversion.org/energy/megajoules-to-kilowatt-hours-conversion.html
Calorific value of biogas in a digester (H _b)	21.6	MJ/m ³	Nijaguna B.T, Biogas Technology, pg no 38
Digester capacity/day (V _b)	2	m ³ /day	Capacity of the digester, Deenabandu Fixed dome model approved by MNRE.
Stove efficiency (η)	60	%	Nijaguna B.T, Biogas Technology, pg no 136
Energy	25.92	MJ/day	<div style="border: 1px solid black; padding: 5px; display: inline-block;">$E = \eta \cdot H_b \cdot V_b$</div> Calculated using the formula taken from Nijaguna B.T, Bigas technology pg no 136
Installed Digester Thermal capacity /day	7.20	kWh/day	Calorific value of biogas (21.6MJ/m ³) x Digester capacity (2m ³) x Unit conversion value MJ to kWh (0.277777778)
Net installed Thermal capacity of the project unit	1.69	kWh _{thermal}	Calculated installed capacity of biogas (quantity of gas consumed for a 4" burner is 0.47 m ³ /hr, thus taken as 4.2 hrs/day, Nigaguna, 2002,Pg no 157)
Total Project units 5000 installed capacity	8.46	MW _{thermal}	Net installed electrical capacity of the unit (1.73) x number of units in the project (5000) / kW to MW conversion value (1000)

The project activity fulfills the condition (c) of paragraph 2 and the detailed assessment is as follows,

- ✓ The validation team has conducted the site visit. It is confirmed that the project is planned for thermal energy generation for cooking and water heating in households and not connected to the grid.
- ✓ Each of the independent biogas unit in the project activity has a thermal energy installed capacity of 1.69 kW_{th} (Please refer above table for rating calculation) and thus smaller than 4500 kW_{th} (1500 kW (installed electrical capacity) x 3 = 4500 kW_{th}). The computation of the thermal capacity for the 2m³ capacity arrived at in the PDD has been verified and found to be in order. The calorific value of the biogas, the volume of the digester unit, the stove efficiency, flow rate of 4 inch burner, unit conversions are verified and the calculation are correct without any material misstatements.

¹⁵ 5 MW_(e) x 3 = 15 MW_{th}. As per General Guidelines to SSC CDM methodologies, Multiply by 3 to derive thermal units from electrical units irrespective of the type of project or methodology applied.

Thus Para 2, condition (c) of the “Guidelines for demonstrating additionality of micro-scale project activities”, Version 04, Annex 26, EB 68 is satisfied by the project activity. CAR-07 and CAR-10 are raised and successfully closed.

SSC applicability Condition (As per Para 8 of EB 68, Annex 26):

The eligibility of project activities as micro-scale CDM project activities will be determined in accordance with the principles laid out in paragraph 3 and paragraph 4 of the General Guidelines to SSC CDM methodologies. (Version 16 or its update), i.e.:

- a) Project activities remain under the thresholds defined above during each year of the crediting period and in cases where ex ante projected emissions reductions show an increase during the crediting period; project activities that go beyond the micro-scale limits in any year of the crediting period are not eligible;*
- b) Renewable energy projects that produce electrical, thermal and mechanical energy, and cogeneration projects are covered. Definitions provided for output capacity and guidelines provided for conversion from electrical to thermal units¹⁶ in the most recent version of General Guidelines to SSC CDM methodologies shall be used. Where applicable, additional guidelines provided in relevant methodologies shall be followed, e.g. eligibility of cogeneration projects as currently defined in AMS-I C;*

Assessment on threshold limit (As per Para 8 of EB 68, Annex 26):

The project activity will remain under the thresholds of 15 MW_{th} installed capacity during each year of the crediting period as the installed capacity of the project activity is 8.46 MW_{th}. As seen from above assessment, the project activity meets the micro-scale threshold and is thus eligible.

Thus Para 8 (a), (b) and condition (c) of the “Guidelines for demonstrating additionality of micro-scale project activities”, Version 04, Annex 26, EB 68 is satisfied by the project activity.

De-bundling applicability Check (As per Para 10 of EB 68, Annex 26):

According to Para 10, micro-scale CDM project activities shall demonstrate that they are not a de-bundled component of a small-scale (SSC) CDM project activity by applying the criteria in the Guidelines on assessment of de-bundling for SSC project activities., for example by suitably considering micro-scale thresholds in the place of SSC thresholds (EB 62, Para 48).

CROSS does not have any CDM projects registered in the same project category and technology. This is the first CDM project activity of the NGO, CROSS. The same is confirmed from UNFCCC website and interview with the director of CROSS. For detailed assessment please refer section 2.2.3 above. Thus the project is not a de-bundled component of a small scale project activity.

From the above analysis it can be concluded that the additionality of the project activity is justifiable since the project activity meets all the applicability conditions as discussed above.

Thus based on “Guidelines for demonstrating additionality of micro scale project activities” Version 04, EB 68, Annex 26, the project activity proves to be additional.

3.5.1 CDM consideration:

According to Para 2, 3, 4 & 5 of ‘Guidelines on the demonstration and assessment of prior consideration of the CDM’ (EB 62, Annex 13) the serious consideration of CDM has been assessed for the project activity.

¹⁶ That is multiply by 3 to derive thermal units from electrical units irrespective of the type of project or methodology applied

The start date of the project activity is not fixed yet as the PP has not contracted/placed order for the equipment or construction. The PDD was web-hosted for public comments on 2012-04-20 (<http://cdm.unfccc.int/Projects/Validation/DB/IBK3RIR7HVE1SZLK7YZMZPZ02UW7TS/view.html>) i.e. before the start date of the project activity. Since the start date of the project activity is after PDD was web-hosted, and the communication regarding the project is been notified to DNA and UNFCCC, on 2012-03-06¹⁷ as per paragraph 98 of VVM 01.2 project participant is not required to demonstrate prior consideration of CDM.

There is no commercial project operational as on 2012-06-11 (date of validation site visit) – The expected start date of the project activity will be 2013-04-01.

The DOE has verified the evidence to support awareness of the CDM prior to the project activity start date. The milestone achieved by the project activity before the start date is mentioned below:

Timeline	Milestone	Documents
2010-11-10	First CDM Training Programme to SCINDeA NGO groups (SACRED, WORD, BEST and CROSS) by Fair Climate Network (FCN)	Awareness towards CDM
2011-06-30	Board Resolution of CROSS to take up CDM project activity	Decisive factor to proceed with CDM
2011-05-23	Second CDM Training Programme to the staff of participating NGOs by FCN	Awareness towards CDM
2011-07-01	Consultancy contract between SCINDeA/CROSS and FCN Technical Team	CDM Development
2011-07-01 to 2011-12-30	Demographic survey and Baseline survey of the project area	Methodology Requirements
2012-01-09	Stakeholders' Meetings	CDM Requirements
2012-02-29	Contract with DOE for Validation of the project activity	CDM Requirements to proceed with validation
2012-03-06	Communication to UNFCCC and NCDMA with regard to Prior Consideration of CDM	CDM serious consideration
2013-04-01	Likely start date of biogas construction after CDM registration, sign ERPA and procure carbon revenue	-

It is TÜV Rheinland validation teams' opinion that the proposed CDM project activity complies with the requirements of the latest version of the guidance on prior consideration of CDM.

In conclusion, the starting dates of the project activity were later to 2008-08-02 as well as the date of publication of the PDD for global stakeholder process. Thus, the proposed project activity is defined as "new project activity" according to the Annex 13 of EB 62 "Guidelines on the demonstration and assessment of prior consideration of the CDM (version 04)".

¹⁷ <http://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html>

3.5.2 Alternatives:

TÜV Rheinland validation team considers the selected baseline is credible and complete and in line with the methodology

3.5.3 Investment analysis:

Not applicable.

3.5.4 Barrier analysis

Not applicable.

3.5.5 Common practice analysis

Not applicable.

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3.5.6 Conclusion of assessment of Additionality

The CDM was seriously considered by the CROSS. The evidences were transparently reviewed by the validation team and considered to be effective. DOE concludes that as per the paragraph 2, 4, 8, 9 and 10 of Annex 26 of EB 68, "Guidelines on the demonstration of additionality of Micro scale project activities", the proposed project activity is automatically additional.

3.6 Monitoring

The monitoring plan in compliance with the applied monitoring methodologies AMS.I.E version 04

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All monitoring parameters in the PDD are realistic and feasible to measure and monitor. The monitoring will be based on a sampling method. Detailed assessment on sampling approach has been provided below in section 3.6.2.

The project consultant had similar work experience in a CDM registered project reference no 0121. FCN supports the PP during implementation and monitoring of the project activity. It is DOE's opinion that the project participant is able to implement the monitoring plan.

3.6.1 Parameters determined ex-ante

The parameter remains fixed throughout the crediting period are available during the validation stage. The same is explained and assessed below,

Parameters	Value applied	Source
Rating of Biogas unit (kW _{th} /digester)	1.69	Please refer Assessment on applicability of Micro-scale additionality (Type-I) and Section B.2 of the PDD.
B _y (tons/yr/family)	3.97 tons/year/family and 19,850 t/year for 5,000 families	Based on survey result as per the methodology AMS-I.E, version 04.
$f_{NRB, y}$	0.95	State of Forest Report, 2011
NCV _{biomass} (TJ/tonne)	0.015	As per the methodology AMS-I.E, version 04
EF _{projected_fossilfuel}	81.6	As per the methodology AMS-I.E, version 04
Diversion of non-	In terms of leakage of emissions, 4.61 -	According to I.E, Version 4, B _y can be

renewable biomass saved under the project activity by non-project households (Tons/yr)	$4.38 = 0.23 \text{ tCO}_2/\text{family/yr}$ and $0.20 \times 5000 = 1,150 \text{ tCO}_2/\text{year}$	multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required
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The validation team has verified the value used against the sources and conclude that all relevant parameters to calculate the GHG emissions reductions of the project have been sufficiently considered and the value of the parameters are real, measureable and conservative. CAR-09 is raised and closed successfully.

3.6.2 Parameters monitored ex-post

According to the approved methodology AMS-I.E, version 04 the following parameters will be monitored:

Sl. No.	Parameters	Description
1	Biogas Units constructed	Monitoring of Biogas unit from procurement of material for construction till commissioning. All the 5000 unit records will be entered and maintained in TRISTLE software. The monitoring will be done 100%.
2	Number of biogas plants operating	As required by the methodology, these parameters have to be monitored biennially. However since the NGO volunteers/biogas field workers are involved in day to day interaction with the project users/beneficiaries, any non-functioning of the biogas unit will be recorded in the log books on daily basis and then transferred to digitized monitoring database which reduce the downtime and proper functioning of the biogas unit. Thus the operation of all the biogas units will be monitored 100%.
3	Non-usage of biogas plants	
4	Confirmation that non-renewable biomass has been substituted	Based on the “Standard for Sampling and Survey for the CDM project activities and Program of Activities, version 02”, both the parameters Confirmation that non-renewable biomass has been substituted and the annual operation hours are proposed to be monitored every year for a period of 7 days at 90/10 precision. Detailed assessment on sampling procedure identified by the PP is provided below.
5	Average annual hours of operation of a system	

Assessment on Sampling Approach:

As required by Section V of EB 69, Annex 05 “Guidelines for sampling and surveys for CDM project activities and Programme of activities”, the evaluation criteria for DOE is as follows,

SI NO	Evaluation criteria for DOE Validation (EB 69, Annex 05)	Yes/No	Assessment/Explanation
a)	<p>Does the sampling plan present a reasonable approach for obtaining unbiased, reliable estimates of the variables?</p> <p>i) In terms of assessing reliability, are the elements of Objectives and Reliability Requirements complete? Do the requirements specified agree with those stated in the appropriate standards? If not, is there a reason why they are not met?</p> <p>ii) From all the different elements of the Design, is there any reason to suspect that the results from the activity will be biased? For instance, is the population under</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>The sampling plan are presented in a reasonable, unbiased and reliable manner which is assessed as follows,</p> <p>1) The project area covers 4 mandals of Chittoor district which has similar geographical area, climatic condition and the proposed project is planned to cover rural agricultural people having cattle at their houses. There is no ambiguity identified during the site visit and the details presented in the PDD are appropriate.</p> <p>2) All the households covered under the project activity are situated in</p>

	consideration only urban households? What about rural households? Might this cause a bias when the data are extrapolated to emission reductions?		mandals and village. So representation of sample for these households is similar and reliable. Hence satisfies the condition.
b)	<p>Is the population clearly defined, and how well does the proposed approach to developing the sampling frame represent that population?</p> <p>i) The population should be clear from the Target Population description. Whether or not the sampling frame is possible or appropriate will depend on the detail and the particular situation, for example if a map is going to be used, a question would be whether a map already exists, and how reliable it is. If a map does not exist, then who is going to create it?</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>The proposed project plants to implement 5000 bio-digesters in 4 mandals of Chittoor district.</p> <p>During baseline demographic survey 5550 households were survey and the proposed sampling frame for the verification represents the same population. Hence satisfied the condition.</p>
c)	<p>Is the proposed sampling approach clear?</p> <p>i) Is it clear which sampling method is being proposed? For example, is it simple random sampling, or some other method of sampling?</p> <p>ii) Does the method agree with the description of the population? Are there clusters or strata, and if so does it state what they are? For example, are they buildings, villages, etc.?</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>The proposed sampling plan is clear,</p> <ol style="list-style-type: none"> 1) The PP has applied simple random sampling to determine the parameter a) Average annual hours of operation of a system. 2) The project is proposed in 4 mandals of Chittoor district (G.D Nellore, S.R Puram, Vedurukuppam and Karvetinagam).
d)	<p>Is the proposed sample size adequate to achieve the minimum confidence/precision requirements? Is the ex-ante estimate of the population variance needed for the calculation of the sample size adequately justified?</p> <p>i) All of the information set out in the sampling plans should help answer this question. If not all information is provided then the question cannot be answered;</p> <p>ii) Is the target value for the population parameter reasonably anticipated?</p> <p>iii) Does the estimate of variability seem reasonable?</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>As recommended in EB 69, Annex 05, the PP has applied 90/10 confidence/precision level to determine the sample size which is valid.</p> <ol style="list-style-type: none"> 1) 5000 bio-digester units have been taken for sample size determination as per the planned bio-digester in the project area. 2) Since the monitoring of the operation of biogas is planned for all 5000 units, considering 75% as normal operation of the biogas plant is acceptable. 3) With a non-responsive rate of 80%, the total sample size determined by the PP annually is 112 households. <p>The calculation to determine the sample size is verified and the resultant sample size is found to be OK.</p>
e)	<p>Is the sample representative?</p> <p>i) Is it clear how the sample is to be selected? For example, is it to be selected randomly?</p> <p>ii) Does the Plan indicate that the sampling frame will be kept (e.g. in hard copy or a computer file of screen</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>The sample is representative which can be reproducible,</p> <ol style="list-style-type: none"> 1) A simple random sampling method has been selected for the project considering the similar geographical nature of the project area.

	shot copy), and that random numbers will be generated and these random numbers will then be used to select the sample?		2) A survey sheet with predetermined questionnaires is proposed to be used to collect the information about the monitoring parameters. All the data collected in hard copy are then entered in Microsoft Excel software. Both hard and soft copy is proposed to be used to monitor the data.
f)	<p>Is the data collection/measurement method likely to provide reliable data given the nature of the parameters of interest and project, or is it subject to measurement errors?</p> <p>i) Are the methods of data collection clear and unambiguous? Are there questions which could be subject to respondent error due to sensitivity (e.g. "How much money do you spend on heating?"), lack of recall (e.g. How many times did you buy fuel last year?), and the like?</p> <p>ii) Are there questions that could be subject to measurement error? For example, is a particular measurement method known to under-record key data, such as the weight of bricks?</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	As explained in Annex 4 of the PDD, the data collection methods provide clear and reliable data.
g)	<p>Are the procedures for the data measurements well defined and do they adequately provide for minimizing non-sampling errors?</p> <p>i) Is the quality control and assurance strategy adequate?</p> <p>ii) Are there mechanisms¹⁸ for avoiding bias in the answer?</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>The sampling survey questionnaires are field tested before starting the survey to identify the adequacy and minimizing the errors,</p> <ol style="list-style-type: none"> 1) The field level workers are involved in collecting the details 2) The survey questionnaires are in local language 3) The volunteers/field workers records/collect the data is then transferred to Micro soft Excel by data entry staff which is then cross checked by evaluator for material mistakes etc. <p>Thus proper QA/QC procedures are met.</p>
h)	<p>Does the frame contain the information necessary to implement the sampling approach?</p> <p>i) Are the proposed skill sets, qualifications and experience of the personnel to be engaged to conduct sampling adequate?</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The proposed staff engaged for field works, data entry, evaluator are literate to collect qualitative and quantitative data during the survey. This was confirmed with the director CROSS during the interview.

In summary, the validation team is convinced of compliance of the monitoring plan with the requirements of the monitoring methodology AMS-IE (version 04). During the on-site assessment, the validation team interviewed the PP (CROSS) that the monitoring arrangements described in the monitoring plan are feasible within the project design. The emission reductions resulting from the proposed CDM project activity can be reported ex post and verified.

CL-06 is raised and closed successfully.

¹⁸ Mechanism for avoiding non-sampling errors (bias) include good questionnaire design, well-tested questionnaires, possibly pilot testing the data collection.

3.6.3 Management system and quality assurance

The project will be implemented after successful registration with UNFCCC. Based on the estimated CERs, the carbon forward funding will be drawn to implement the project activity. The project plans to implement in 3 phases. During each milestone achievement from the date of procurement of material till the commissioning, the data recorded will be entered in the project database. Once the project is commissioned, the PP will have an end user agreement signed with the end-user which mentions the roles and responsibilities of the end-user. For CDM purpose, CROSS will appoint dedicated team to monitor and maintenance of biogas unit. It is also confirmed during the site visit that there will be a separate O&M manual for the implementation and monitoring of the project activity. Proper emergency preparedness will be explained during the signing of end user agreement about the minor repairs, loss of cattle, non-availability of fodder, end-user transfer etc.

CROSS will form a team of CDM with Biogas CDM manager for overall responsibilities related to CDM starting from construction till co-ordination with DOE, DNA and CDM consultants. He/She should report to CROSS director. All the biogas CDM staff and field workers shall co-ordinate with Biogas CDM project manager for proper functioning of biogas system and quality management. Field level monitoring will be done by Biogas field workers. The CDM team will have a special IT professional for maintaining the digitalized monitoring solution and monitoring sheet for CDM verification. The main software used for digitalized monitoring is TRISTLE. Based on the data provided in the software, the underperformance, variation in recorded data, malfunctioning shall be recorded. An Accountant will be appointed to take care of all the financial related matters. Since biogas plant construction requires well skilled masons, Local Masons will be trained at ongoing Biogas CDM Projects and they will be involved in the construction of bio-digesters. All the details of personnel involved in project activity will be recorded. The data will be kept for 2 years following the end of the first crediting period. The detailed operational and management structure that the project operator will implement to monitor emission reductions is as described in section B.7.2 of the PDD. The same was confirmed from the interview with CROSS team and FCN. Hence the project follows proper management system and quality assurance on emission reduction.

CL-03 is raised and closed successfully.

3.7 Sustainable Development

The host country DNA, Ministry of Environment and Forests of India has accorded approval to the project; the approval letter states that the project contributes to sustainable development, which was checked by the validation team to be valid. The project activity is in compliance with all current applicable legislations. Moreover, the location of the project activity is in remote and economically backward region and hence largely contributes to the social wellbeing of the region. The introduction of biogas units in the project area will reduce the dependence on non-renewable biomass which is the main fuel used for cooking. The implementation of the biogas units will also improve the indoor quality as the biogas stoves will replace traditional firewood stoves. On the whole, the quality of life in the region is expected to improve; women need not travel long distances for collecting firewood. The sludge from the biogas digester is used as a fertilizer in the agricultural fields. The project overall creates many environmental and social benefits, and improved lifestyle for rural women.

In conclusion, the Validation Team is of the opinion that the project activity is in full compliance with all applicable requirements for the CDM by leading to emission reductions additional to what would have otherwise occurred, providing for reliable and measurable emission reductions with sustainable development in India through improvement of environmental condition, reduction of air pollutants.

3.8 Environmental Impacts

As per the Schedule 1 of the EIA notification 2006, given by the Ministry of Environment and Forests under the Environment (Protection) Act 1986, the proposed biogas project activity doesn't fall under the list of activities requiring EIA.

The validation team concludes that the environmental impact by the project activity need not to be assessed by the project proponent and the same is stated in the PDD. It is validation team's opinion that the project activity does not cause the adverse environmental impacts and there are no regulations or requirement by India to conduct the EIA for the project activity. The same is confirmed from the

(<http://moef.nic.in/legis/eia/so1533.pdf>)

3.9 Local Stakeholder Consultation

A local stakeholders meeting is reported to have been conducted on 2012-01-09 at Hindu Muslim Kalyana Mandapam, Karvetinagaram, Chittoor District, Andhra Pradesh. An open invitation to the meeting was published in the local newspaper “Andhra Prabha” dated 2012-01-08./P32/.The stakeholders were invited through letters, Newspaper (Andhraprabh), emails and personally to various categories of stakeholder’s like local communities, local policy makers, official representatives, local NGOs, Gold Standard international NGOs, local NGOs and the DNA to attend the stakeholders meeting. The meeting was attended by 185 people from nearby villages, members of the Village Panchayat, local officials, policy makers, NGO’s, farmers and local entrepreneurs. Secondly, whether adequate and advance information was provided to the invitees about the likely agenda for the meeting and whether the information about the project was available to them beforehand. The project also has applied for Gold standard, so the PP has followed the procedure as mentioned in Gold standard to conduct the local stakeholder consultation process. All factors had been taken care and the same was confirmed during the interview and documentary evidences. The participants were eager to see that the project was implemented early as it would help them / their dependents to get employment, improve quality of living. The project proponent gave evaluation form with questionnaires. All the stakeholders are free to fill the evaluation form and mention suggestions about the project activity. The main discussion during the stakeholder consultation process was about the implementation time, construction and maintenance and issues related to biogas plant. All the comments were satisfactorily explained by the PP to the stakeholder. No negative comments were received/P30/, /P31/. The project participant has taken due account of all comments received by the stakeholders and its summary is described in the section E.2 and E.3 of the PDD adequately.

TUV Rheinland considers the local stakeholder consultation carried out adequately.

3.10 Comments by Parties, Stakeholders and NGOs

The PDD version 01 of 2012-03-15 was made publicly available on (<http://cdm.unfccc.int/Projects/Validation/DB/IBK3RIR7HVE1SZLK7YZMZPZ02UW7TS/view.html>) from 2012-04-20 to 2012-05-19 in order to invite comments from public stakeholders. No public comments have been received during that period.

Appendix A

CDM Validation Protocol

“Micro Scale Biogas CDM Project of CROSS” in India

Report No. 01 997 9105069652

Table 1: Validation requirements (based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual version 1.2)					
Checklist question	Ref.	MoV ¹⁹	Findings, comments, references, data sources	Draft conclusion	Final conclusion
1. Approval(VVM V E.1)					
1.1 Have Letters of Approval have been provided from all involved Parties?	/P01/	DR,I	National CDM Authority, under the Ministry of Environment and Forests, Government of India, is the Designated National Authority in India. Letter of approval from the Designated National Authority, is to be submitted for verification. Based on the review of the version 01 of the PDD, the proposed project is a unilateral project, with India as host party. CAR-01 is raised.	CAR-01	OK
1.2 Are all Parties, who issued the LoA, Parties to the Kyoto Protocol and is this stated in the LoA?	/P01/	DR,I www	India is the host party for this project and ratified the Kyoto Protocol on 2002-08-22. In the Status of Ratification of Kyoto Protocol last modified by UNFCCC on 2006-07-10, India is listed at serial no. 68. Hence CAR-01 is raised	CAR-01	OK
1.3 Is every LoA from the Parties involved issued by an organisation listed as Designated National Authority (DNA) on the UNFCCC web site?	/P01/	DR,I	The proposed project is a unilateral project, with India as host party. The Letter of Approval from the host party (India) has not been submitted either by the DNA or the project participant. Hence CAR-01 is raised	CAR-01	OK
1.4 Is the participation in the CDM project activity voluntary and is this stated in all LoAs?	/P01/	DR,I	During the onsite visit, it was identified that the letter of approval from DNA of India has been pending. Hence CAR-01 is raised	CAR-01	OK

¹⁹ MoV = Means of Verification, DR = Document Review, I = Interview, www = internet search.

1.5 Is the LoA unconditional with respect to 1.2 to 1.4?	/P01/	DR,I	During the onsite visit, it was identified that the letter of approval from DNA of India has been pending. Hence CAR-01 is raised	CAR-01	OK
1.6 Is the title of the CDM project activity as given in the PDD identical with the title given in all LoAs and Modalities of Communication?	/P01/	DR,I	During the onsite visit, it was identified that the letter of approval from DNA of India has been pending. Hence CAR-01 is raised	CAR-01	OK
1.7 If any of provided LoAs contains additional specification of the CDM project activity (PDD version number, validation report version number, amount of ER, etc.) are those specifications valid and consistent with other documents?	/P01/	DR,I	During the onsite visit, it was identified that the letter of approval from DNA of India has been pending. Hence CAR-01 is raised	CAR-01	OK
1.8 Does the project activity involve any public funding from Annex I Parties? If yes, has Annex I Party provided a written confirmation that the use of such funding does not lead to the diversion of the official development assistance.	/P01/ /P05/	DR,I	As per PDD and interview with PP, the project will be implemented only after registration. The project will be funded by carbon finance. No other public funding will be used in the implementation of the project.	OK	OK
2. Participation (VVM V E.2)					
2.1 Are the Parties and project participants (PP) listed in the section A.3 of the PDD correctly and is this information consistent with the contact details provided in Annex 1 of the PDD?	/P01/	DR	Information regarding the project participant and parties provided in Section A.3 and Annex 1 of the PDD is totally consistent. The name of the project participant is Community reconstruction of Social Service (CROSS)	OK	OK
2.2 Has every Party involved approved the participation of each corresponding PP, either by means of a LoA or by a separate written document?	/P01/	DR,I	The proposed project is a unilateral project and there is no involvement/approval required by corresponding PP either by means of a LoA or by written document. The Letter of Approval from the host party (India) has not been submitted. Hence CAR-01 is raised.	CAR-01	OK

2.3 Do all participating Parties fulfil the participation requirements as follows: a) Party has ratified the Kyoto Protocol b) Party has designated a Designated National Authority c) The assigned amount has been determined	/P01/	DR,I www	During the onsite visit, it was identified that the letter of approval from DNA of India has been pending. Hence CAR-01 is raised	CAR-01	OK
2.4 Do the letters of approval meet the following requirements? a) LoA confirms that Party has ratified the Kyoto Protocol b) LoA confirms that participation is voluntary c) The LoA confirms that the project contributes to the sustainable development of the host country? d) The LoA refers to the precise project activity title in the PDD	/P01/	DR,I www	During the onsite visit, it was identified that the letter of approval from DNA of India has been pending. Hence CAR-01 is raised	CAR-01	OK
3. Project Design Document (VVM V E.3)					
3.1 Is the PDD presented for validation based on the latest template available at the UNFCCC website?	/P01/ /B12/	DR,I	The PDD version 1 has applied prescribed format Clean Development Mechanism Project Design Document Form (CDM-SSC-PDD), Version 03, in effect as of 2006-12-22.. The template has not been altered and no modifications have been made to the font, format, headings and logo.	OK	OK
3.2 Has the PDD been established in accordance with the CDM requirements for completing PDDs issued by the CDM EB?	/P01/ /B12/	DR	Yes, the PDD has been duly filled in accordance with the "Guidelines for completing the simplified Project Design Document (CDM-SSC-PDD)", Version 5, and dated 2007-09-14 which is valid guideline till 2012-09-30 and the directions contained under Section B (Pages 6/24 to 16/24) of the above guidelines. Nevertheless CL-04 is raised.	CL-04	OK
4. Project Description (VVM V E.4)					

<p>4.1 Does the PDD contain a description, which provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation?</p> <p>4.1b) Is the description (incl. any process flow-charts, Spreadsheets etc.) complete, coherent and consistent with the provisions of the monitoring plan?</p> <p>4.1c) Is the project's location clearly defined?</p>	/P01/	DR, I	<p>The PDD lacks clarity on the usage of terminologies such as biogenic, Cow dung, Biomass waste, and waste water used to be fed into the bio-digester along with the cow dung. Also the technical specification such as capacity, retention time, mixing proportion, feed materials of the bio-digester and the size and capacity and flow rate of the burner are not given in the PDD. The webhosted PDD is presented with the cross sectional schematic diagram of 'Deenabandhu bio-digester' and pictures of bio-digester and its usage in households for cooking needs. The location of the project is clearly defined in the PDD. However CAR-02 and CL-01 are raised.</p>	CAR-02 CL-01	OK
<p>4.2 In the case of greenfield project activity, is the project design described sufficiently by means of specifications, drawings and manuals?</p>	/P01/	DR, I	<p>Yes, The project activity is a green field Project and the drawings of the bio digester are given in the PDD. During site visit, randomly selected households were visited by the DOE and confirm that the project is a greenfield project.</p> <p>However the key technical specifications are not included in the PDD. Hence CAR-02 is raised</p>	CAR-02	OK
<p>4.3 Does the project activity reflects current good practices, uses state of the art technology or would the technology result in a significantly better performance, than any commonly used technologies in the host country?</p>	/P01/ /B05/	DR,I, www	<p>Yes, The PP has employed Deenabandhu model bio-digester for generation of biogas, which is more suitable household size biogas bio-digester plant in India. This type of bio-digester plant is commonly used in Indian households.</p> <p>Hence the project technology reflects current good practice.</p>	OK	OK
<p>4.4 In cases where the project activity involves the alteration of an existing installation or process, does the PDD provide a clear description of the differences between the project and the pre-project scenario?</p>	/P01/	DR, I	<p>No, the project is a Greenfield project activity. Hence it does not involve any alteration of an existing installation.</p>	OK	OK

<p>4.5 What type is the project?</p> <p>i) Project in existing facility or utilizing existing equipment(s)</p> <p>ii) Project is either a large scale project or a non-bundled small scale project with emission reductions exceeding 15 000 tCO₂e per year. In this case, a site visit must be performed.</p> <p>iii) Project is a bundled small scale project, with each project in the bundle with emission reductions not exceeding 15,000 tCO₂e per year. In such case the number of physical site visits may be based on sampling, if the sampling size is appropriately justified through statistical analysis.</p> <p>iv) The project is an individual small scale project activity with emission reductions not exceeding 15 000 tCO₂e per year. In this case, DOE may not conduct a physical site visit as appropriate.</p> <p>v) Greenfield project</p>	/P01/	I	<ol style="list-style-type: none"> 1. The project is a green field project. 2. The project is a micro scale CDM project activity. 3. The project is not a bundled project activity. 4. The annual emission reduction presented in the webhosted PDD is 16,456 tCO₂e. So the DOE has conducted the site visit as per VVM requirements. <p>A site visit was conducted on 2012-06-11 to crosscheck the baseline scenario and the credibility of the baseline survey. The households were randomly selected by the DOE and the beneficiaries of project activity are interviewed. The project is a green field project.</p>	OK	OK
<p>4.6 How was the design of the project assessed?</p> <p>i) Physical site inspection</p> <p>ii) Reviewing available designs and feasibility studies</p>	/P01/ /I-02/ /B26/	I, www	<p>The project is a green field project. There is no bio-digester installation in the project activity. The installation starts only after the successful registration of the project activity. During the site visit, the baseline scenario was cross checked against the description presented in the webhosted PDD and the demographic survey spread sheet. Based on the review of publicly available information, the design specification presented in the PDD is on par with the current practise in India. The project consultant FCN has a registered CDM project with same technology. This was discussed during the site visit and interview with FCN. Thus the design of the project activity was assessed to be appropriate.</p>	OK	OK

4.7 Does the project qualify as a small scale CDM project activity as defined in paragraph 6(c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/P01/ /P07/ /B19/ /B21/	DR,I	The project is a micro scale project activity comes under Type I. Category (Renewable Energy Projects) Type I: The end users of the subsystems are households having individual subsystem thermal energy generation capacity is 1.73 kWth which is less than 4500 kWth capacity. Hence as per the 2c of EB 63 Annex 23, the proposed project activity qualify as micro scale CDM project activity. Also the total thermal energy generation capacity of the proposed project is 8.66 MWth for 5000 bio-digester which qualifies a small scale CDM project activity. Nevertheless CAR-10 is raised.	CAR-10	OK
4.8 Is the small scale project activity a debundled component of a larger project activity in accordance with the rules defined in appendix C of the simplified modalities and procedures for small-scale CDM project activities?	/P01/ /B28/ /B19/	DR,I	Since the project activity is a micro scale project activity the PDD explains the micro scale project activity is not a debundled component of small scale project activity. The project proponent has not registered or applied for registration of another CDM project activity within the last two years in the same project category and technology measure within 1 km of the project boundary. Hence, as per the "Guidelines on assessment of debundling for SSC project activities" which is referred in EB 63 Annex 23, the micro scale project activity is not a de-bundled component of any small scale project activity.	CL-05	OK
5. Baseline and Monitoring methodology(VVM V E.5)					
5.1 General requirements					
5.1.1 Is the methodology used in the project activity approved by the CDM EB and is the selected version still valid?	/P01/ /B13/	DR www	Yes, PP has used Small scale methodology AMS I.E "Switch from Non-Renewable Biomass for Thermal Applications by the User", version 04, EB 60 which is valid at the time of webhosting for the global stakeholder consultation. Even though version 05 of the methodology came during the course of validation AMS i.E version 04 can be submitted for request for registration until 2013-04-03 23:59:59 GMT.	OK	OK
5.2 Applicability of the selected methodology					
5.2.1 Does the project activity qualify under the criteria for small-scale CDM project activities set out in § 6 (c) of decision 17/CP.7 and Annex	/P01/	DR,I	Please refer checklist 4.7 above	OK	OK

<p>II of the Modalities and Procedures for the CDM?</p> <p>5.2.1a) If the project applies a small-scale methodology, does the project also comply with the general guidelines to SSC CDM methodologies, which provides guidelines on equipment capacity, equipment performance/lifetime, baseline identification for type-II/III Greenfield project activities, sampling and other monitoring-related issues?</p>					
<p>5.2.1.1 If yes, does the PDD extensively demonstrates and confirms that the small-scale project activity is not a debundled component of a larger project?</p>	/P01/	DR,I	Please refer checklist 4.8 above	OK	OK

5.2.2 Are all applicability conditions of the selected baseline and monitoring methodology and all tools involved satisfied by the project activity?	/P01/ /P07/ /P14/ /P15/ /P20/ /B13/	DR,I	<p>As per AMS I.E methodology Project satisfies the following applicability conditions as mentioned in section B.2 of the PDD.</p> <ol style="list-style-type: none"> 1. This category comprises small thermal appliances that displace the use of non-renewable biomass by introducing new renewable energy end-user technologies. Examples of these end user technologies include biogas stoves and solar cookers. <p>The project activity comprises of biogas units that will displace the use of non-renewable biomass by introducing new renewable end-user technology, the biogas units.</p> <ol style="list-style-type: none"> 2. Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods. <p>The communities are using non-renewable biomass since 31st December 1989.</p> <ol style="list-style-type: none"> 3. The capacity of the project activity is 8.66 MW_{th} and will remain under this limit during every year of the crediting period as per the ER calculation. 4. Hence the project activity satisfies all the applicability conditions of the applied small scale methodology. AMS I.E <p>Nevertheless CAR-03 is raised</p>	CAR-03	OK
5.2.3 Is the selection of the applied baseline and monitoring methodology justified?	/P01/ /B13/	DR,I	Yes, the selection of applied monitoring methodology is justified in the PDD	OK	OK
5.2.4 Is the selected methodology correctly quoted in all related documents?	/P01/ /B13/	DR	Yes, the selected methodologies are correctly quoted in all related documents CAR-03 is raised w.r.t the remote sensing data of FSI report.	CAR-03	OK

5.2.5 Does the PDD sufficiently describe all the GHG emission sources or sinks occurring as a result of project activity, which have not been accounted for under the selected methodology and are expected to contribute more than 1% of the overall expected average annual emission reductions?	/P01/ /B13/	DR,I	<p>There is no sources or sinks occurring as a result of project activity and are expected to contribute more than 1% of overall expected average annual emission reductions which is not described in the methodologies.</p> <p>Source of emission sources due to the project activity documented is not inline with the methodology AMS I.E Hence CAR 08 is raised.</p>	CAR-08	OK
5.3 Project boundary					
5.3.1 Does the PDD correctly describe the project boundary? Are they clearly defined and in accordance with the methodology?	/P01/ /B13/	DR,I	Yes, the project boundary is correctly described in the PDD. However the reference to the paragraph of AMS-I.E methodology is not correct. CAR-04 is	CAR-04	OK
5.3.2 Does the PDD correctly indicate and describe the emission sources and sinks of GHG gases that are included in the project boundary?	/P01/ /B13/	DR,I	Yes, the PDD correctly indicate and describe the emission source and sinks or the GHG gases that are included in the project boundary. In the case of Emission from the use of non-renewable wood, the emissions of methane and N2O have been excluded as allowed by the methodologies. In the case of emissions from animal manure, CO2 and N2O have been excluded as allowed by the methodologies. The exclusions have been suitably justified	OK	OK
5.3.3 In cases where the methodology allows project participants to choose whether a source or gas is to be included in the project boundary, is the choice explained and justified by PPs?	/P01/ /B13/	DR	Not applicable as the methodology AMS I.E does not provide any choice for source or gas to be included in the project boundary	OK	OK

5.3.4 Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/P01/ /B13/	DR	No such emission sources are expected in the proposed project activity that deviates the project from the applicability of the methodology	OK	OK
5.4 Baseline identification					
5.4.1 Has the procedure contained in the selected methodology to identify the most reasonable baseline scenario been applied correctly and documented in the PDD?	/P01/ /P04/ /B13/	DR,I	<p>The baseline of the project activity is provided in the methodology.</p> <p>In the baseline, the households would have continued using the non-renewable biomass in the households for cooking and water heating. This is conformed through baseline survey. However as per the methodology AMS I.E it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs. The same is described in the PDD.</p> <p>Hence the procedure contained in the selected methodologies to identify most reasonable baseline scenario has been applied.</p>	OK	OK
5.4.1.1 Is the identified baseline scenario plausible?	/P01/ /B13/	DR,I	The baseline scenario is the pre-project (current) scenario and it is confirmed through the baseline survey and the same is verified through site visit. Hence the identified baseline scenario is plausible.	OK	OK
5.4.1.2 Are all assumptions stated in a transparent and conservative manner?	/P01/ /B13/	DR,I	Yes, All the assumptions and sources considered for project justification is transparent and conservative	OK	OK
5.4.2 Does the selected methodology require the use of tools and does PDD reflects that correctly?	/P01/ /B13/	DR,I	No tools were referred by the methodology and not used by the PP.	OK	OK
5.4.2.1 Were all the tools applied correctly?	/P01/ /B13/	DR,I	Not applicable as no tool is referred in the methodology	OK	OK

5.4.3 In case the methodology requires several alternative scenarios to be considered in the identification of the most reasonable baseline scenario, have all scenarios been considered and have no reasonable alternative scenario been excluded?	/P01/ /B13/	DR,I	The methodologies do not require several alternative scenario to be considered in the identification of baseline	OK	OK
5.4.3.1 Has the choice of the baseline scenario been done using conservative assumptions?	/P01/ /P07/ /B13/	DR,I	<p>The only baseline scenario identified in the methodology has been considered in the PDD. All the assumptions. The baseline is determined by demographic survey conducted in the project area. The excel sheet with the baseline survey data collected for 5550 households has been verified. The excel sheet contains data on the list of beneficiaries and the consumption of kerosene, firewood, biomass, along with details of income of household, number of cattle, and number of individuals in each household, , fuel wood price, time taken for travel in collecting the fuel wood, etc.</p> <p>The survey also contains statistics on livestock in the households. The survey results show that the consumption of fuel wood for cooking in the baseline scenario per household annually.</p> <p>The results of the survey are reasonable, and were checked by the VT during the site visit. The survey results have been provided in separate spread sheet to the DOE. The survey questionnaires and the data have been verified and found to be in order.</p> <p>However baseline survey does not have results for the two parameters as described in the PDD. Hence CAR-12 is raised</p>	CAR-12	OK
5.4.4 Is the identified baseline scenario reasonable according to the assumptions, calculations and rationales used in the PDD and other reference sources?	/P01/ /P07/	DR,I	Though the survey has been conducted for the determination of average per capita biomass consumption in the project region PDD fails to demonstrate the Non renewable biomass in the project region as per the methodology requirments..Hence CAR-03 is Raised	CAR-03	OK

5.4.6 Does the PDD describe how the national and sectoral policies, macro-economic trends and political aspirations relevant to the baseline scenario have been identified and considered in the PDD?	/P01/	DR,I	No, the PDD doesn't describe how the national and sectoral policies, macro-economic trends and political aspirations relevant to the baseline scenario. CAR-05 is raised.	CAR-05	OK
5.4.7 Does the PDD provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the project activity?	/P01/ /P07/	DR,I	Yes, the PDD provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the project activity.	OK	OK
5.5 Algorithm and/or formulae used to determine emission reductions					
5.5.1 Are all calculations applied and documented according to the selected methodology and in a complete and transparent manner to calculate emission reductions from the project activity? 5.5.1b) Are correct units applied and consistency between parameter dimensions and parameter value ensured?	/P01/ /P07/ /B13/	DR	Yes, all calculations applied and documented according to the selected methodology. However there is an inconsistency identified while applying value for the calculation of emission reductions from the project activity. CAR-07 is raised.	CAR-07	OK
5.5.2 In case the methodology allows a selection between different options for equations or parameters, has adequate justification been given and have the correct equations and parameters been used, in accordance with the methodology selected?	/P01/ /P07/ /B13/	DR	The equations applied are as follows: The equation for BE _y applied in the PDD is as per the applicable methodology for the NRM component. $ER_y = B_y * f_{NRB,y} * NCV_{Biomass} * EF_{projected_fossilfuel}$	OK	OK

5.5.3 In case some data and parameters will not be monitored throughout the crediting period, but have already been determined and fixed, are all data sources, assumptions and calculations correct, applicable to the proposed CDM project activity and conservative?	/P01/ /P07/ /B13/	DR	All sources and assumptions are appropriate. Parameters that remain fixed throughout the crediting period have been sourced as required by the methodology. No equation or data is ambiguous.	OK	OK
5.5.4 In case data and parameters will be monitored on implementation and hence become available only after validation of the project activity, are the estimates provided in the PDD for these data and parameters reasonable?	/P01/ /P07/ /B13/	DR	Yes, The number of biogas units installed and the operating days will be monitored after the implementation of the project. These estimates are provided in the PDD.	OK	OK
5.5.5 Have the major risks and uncertainties, which can influence the emission reduction estimates, been identified and addressed in the PDD?	/P01/ /P07/ /B13/	DR	Explanation of sampling has been provided in the PDD. However please clarify how the selected approach is in line with the guideline. CL-06 is raised.	CL-06	OK
5.5.6 Are the calculations documented according to the approved methodology and in a complete and transparent manner in calculating the project emissions? Have conservative assumptions been used when calculating the project emissions?	/P01/ /P07/ /B13/	DR	No project emission has been considered for the project activity which is in line with the methodology AMS-IE version 04. Validation team also verified during the onsite visit and found no situations leads to the GHG emissions due to the implementation of the project activity.	OK	OK
5.5.7 Are uncertainties in the project emission estimates properly addressed?	/P07/ /B13/	DR	Please refer the above checklist point	OK	OK
5.6 Leakage					

5.6.1 Has the leakage been identified and calculated according to the approved methodology?	/P01/ /P07/ /B13/	DR	As per para 10 (a) of AMS-I.E, version 04, the diversion of non-renewable biomass saved under the project activity by non-project households is considered as leakage. The PP has chosen a net to gross adjustment factor of 0.95 as per the methodology to account for leakages. The value is fixed for the first crediting period and thus no survey is required to monitor the parameter. In addition, the project doesn't involve any transfer of project equipment from or to the project activity. Leakage as per AMS-I.E, has been presented in the PDD. The same is verified and found to be valid and correct. Nevertheless CAR-09 is raised	CAR-09	OK
5.6.2 Have the leakage been addressed in complete, conservative and substantiated manner?	/P01/ /P07/ /B13/	DR	Please refer 5.6.1	CAR-09	OK
5.6.3 Are uncertainties in the leakage emission estimates properly addressed?	/P01/ /P07/ /B13/	DR	Please refer 5.6.1	OK	OK
6. Methodology-related issues for afforestation or reforestation CDM project activities					
<i>Add specific A/R requirements – if applicable!</i>			<i>Not applicable for this CDM project activity</i>	<i>O.K.</i>	<i>O.K.</i>
7. Additionality (VVM V E.6)					
7 a) What approach/tool does the project use to assess additionality? Is this in line with the methodology? In case of small-scale CDM project activities, is Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities applied considering also the “Non-binding best practice examples to demonstrate additionality for SSC project activities”.	/P01/ /B19/	DR	The project being a SSC project of capacity less than 15 MW, the additionality as described in the PDD has been determined as per EB 68, Annex 26- “Guidelines for demonstrating additionality of micro scale project activities”- Version 04. The information in the PDD and supporting documents prove that the project falls under the thresholds and other criteria defined by the guidelines, and hence is deemed additional	OK	OK

7 b) Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives? Is sufficient evidence provided to support the relevance of the arguments made?	/P01/ /B19/	DR	No alternative has been argued in the PDD as the methodology provides baseline scenario.	OK	OK
7 c) What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/P01/ /B19/	DR	The project additionality is based on micro scale additionality. No investment analysis or barrier analysis are presented in the PDD.	OK	OK
7.1 Prior consideration of the CDM (VVM V E.6.III.a)					
7.1.1 Is there documented evidence provided by the project participants on how and when the decision to proceed with the project activity was taken?	/P01/ /P33/	DR, I	The project will commence only after the successful registration of project with UNFCCC. However it was decided during the board meeting held on 2011-06-30 about the serious consideration of CDM to proceed implementing the project after registration with CDM. In parallel, the PP has appointed FCN as the consultant on 2011-07-01. Later as required by the methodology, the consultant along with the PP had conducted Demographic and baseline survey during the period from July 2011 to December 2011. Though there is no real action about the project activity, the notification to proceed with CDM has been informed to UNFCCC and NCDMA, MoEF, India on 2012-03-06. Thus all these evidences have clearly proved that the project has considered CDM seriously before the start of the project activity.	OK	OK
7.1.2 Is the starting date of the project activity, reported in the PDD, in accordance with the "Glossary of CDM terms" and CDM VVM (§99)?	/B15/ /P01/	DR, I	The project will commence only after the successful registration of project with UNFCCC.	OK	OK
7.1.3 Is the date stated in the provided evidence consistent with other available evidence (e.g. dates of construction, purchase orders for equipment)?	/B15/ /P01/	DR, I	Please see above comment.	OK	OK

7.1.4 If the project was not published and the starting date is on or after 2nd August 2008, was it possible to receive from UNFCCC secretariat and DNA a written confirmation that PPs previously informed the above entities on commencement of the project activity and of their intention to seek CDM status?	/B15/ /P01/ /P33/	DR, I	Please see above comment.	OK	OK
7.1.5 For the project activities with a starting date before 2nd August 2008 and before the actual publication, was there enough evidence presented to prove that PPs were previously aware of CDM?	/B15/ /P01/ /P06/	DR, I	Please see above comment.	OK	OK
7.1.6 For the project activities with a starting date before 2nd August 2008 and before the actual publication, was there enough evidence presented to prove that CDM benefits have been a decisive factor in the decision to proceed with the project activity?	/B15/ /P01/ /P06/	DR, I	Please see above comment.	OK	OK
7.1.7 Does the individual or body that took the decision to proceed with the project activity have/had the authority to do so?	/B15/ /P01/ /P06/	DR, I	Please see above comment.	OK	OK

7.1.8 For the project activities with a starting date before 2nd August 2008 and before the actual publication, was there enough evidence presented to prove that PPs were taking continuing and real actions to secure CDM status for the project in parallel with its implementation?	/B15/ /P01/ /P06/	DR, I	Please see above comment.	OK	OK
7.1.7 In case there is a significant gap between the start date of the project activity and the commencement of validation, how was it possible for the project participant to commit funds to the project in advance of receiving a positive validation opinion?	/B15/ /P01/ /P06/	DR, I	Please see above comment.	OK	OK
7.1.8 How has the starting date of the project activity been determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/B15/ /P01/ /P06/	DR, I	Please see above comment.	OK	OK
7.1.9 Is the stated expected operational lifetime of the project activity reasonable?	/B15/ /P01/ /P06/	DR, I	Please see above comment.	OK	OK
7.1.10 Is the crediting period start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/B15/ /P01/ /P06/	DR, I	Please see above comment.	OK	OK
7.2 Identification of alternatives(VVM V E.6.III.b)					

7.2.1 Does the PDD identify and list credible alternatives to the CDM project activity in order to determine the most realistic baseline scenario, unless selected approved methodology prescribes/identifies the baseline scenario and no further analysis is required?	/P01/	DR	Not applicable	OK	OK
7.2.2 Does the list of alternatives include as one of the options that the project activity is undertaken without being registered as a CDM project activity?	/P01/	DR	Not applicable	OK	OK
7.2.3 Does the list contain all realistic/credible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the project activity?	/P01/	DR	Not applicable	OK	OK
7.2.4 Is the exclusion of the alternatives for legal reasons justified?	/P01/	DR	Not applicable	OK	OK
7.3 Investment Analysis(VVM V E.6.III.c)					
7.3.1 Are all sources of revenues (including savings) have been considered in the PDD and all calculations?	/P01/	DR	Not applicable	OK	OK
7.3.2 Is the type of investment analysis selected correctly in the PDD? Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/P01/	DR	Not applicable	OK	OK

7.3.3 Is the selected financial indicator chosen and applied correctly? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/P01/	DR	Not applicable	OK	OK
7.3.4 Is the guidance on IRR calculation and assessment correctly applied?	/P01/	DR	Not applicable	OK	OK
7.3.5 In case project participants use values from Feasibility Study Reports (FSR) is it possible to verify that the period between the FSR date and investment decision was reasonably short and FSR values did not change materially?	/P01/	DR	Not applicable	OK	OK
7.3.6 Are all the values consistent between FSR and PDD and are inconsistencies properly justified?	/P01/	DR	Not applicable	OK	OK
7.3.7 Were all the values from FSR applicable and valid at the time of the investment decision?	/P01/	DR	Not applicable	OK	OK
7.3.8 Is it reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants or some verifiable circumstances that have lead to a change in the benchmark?	/P01/	DR	Not applicable	OK	OK
7.3.9 Is the Investment Analysis prepared in compliance with the latest version of the "Guidance on the Assessment of Investment Analysis" as provided by the CDM EB?	/P01/	DR	Not applicable	OK	OK

<p>7.3.10 Do the project include all the data sources used (input & output / loss & profit) and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.</p> <p>Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?</p> <p>Has salvage value been taken into account? Is working capital returned in the last year of operation?</p> <p>How are the PLF of the project assessed?</p> <p>How are output price assessed?</p> <p>How are O&M cost assessed?</p>	/P01/	DR	Not applicable	OK	OK
<p>7.3.11 Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered?</p> <p>Is the range of variations (10% in default) is reasonable in the project context?</p> <p>Have the key parameters been vary to reach or cross the benchmark and have the likelihood of this to happen been justified?</p>	/P01/	DR	Not applicable	OK	OK
7.4 Barrier analysis(VVM V E.6.III.d)					

7.4.1 Are there any issues addressed in the barrier analysis that have a clear impact on the financial viability of the project activity and that shall be assessed by an investment analysis?	/P01/	DR	Not applicable	OK	OK
7.4.2 Do the listed barriers exist and is their existence substantiated?	/P01/	DR	Not applicable	OK	OK
7.4.3 Would any of the identified barriers prevent the implementation of the project activity but not equally prevent the implementation of the possible alternatives, in particular the implementation of the identified baseline scenario?	/P01/	DR	Not applicable	OK	OK
7.5 Common practice analysis(VVM V E.6.III.e)					
7.5.1 If the PPs claim in the PDD that CDM project activity is the “first of its kind”, is it justified?	/P01/	DR	Not applicable	OK	OK
7.5.2 Are the geographical boundaries of the project activity identified correctly?	/P01/	DR	Not applicable	OK	OK
7.5.3 Does the PDD provide an explanation why this region was selected and deemed more appropriate and is this explanation traceable and reliable?	/P01/	DR	Not applicable	OK	OK
7.5.4 Are there similar operational project activities, other than CDM activities, “widely observed and commonly carried out” in the defined region?	/P01/	DR	Not applicable	OK	OK

7.5.5 In case there are similar commercially operated project activities, other than CDM activities, already “widely observed and commonly carried out” in the defined region, are there essential distinctions between the CDM project activity and the other similar activities?	/P01/	DR	Not applicable	OK	OK
8. Monitoring plan (VVM V E.7)					
8.1 Are all parameters required by the selected approved methodology or tool identified and listed in the PDD? Note: not all methodologies indicate monitoring parameters in tabular form or by reference to the variables used in formulae; Nonetheless, all parameters indicated in the methodology and applicable to the project must be listed in the PDD, omissions due to non-applicability be justified.	/P01/ /B13/	DR	All the parameters required by the methodology have been mentioned in the PDD and are in line with the methodology.	OK	OK
8.2 Is the measurement method clearly stated for each value to be monitored and deemed appropriate? Does the monitoring plan record data in the original form as generated, providing QA/QC procedures to be used on the measurement method?	/P01/ /B13/	DR	Measurement method has been stated in the PDD. QA/QC procedure has been mentioned in the PDD. The project has dedicated operation manual to monitor all the parameters as committed in the PDD and methodology. CL-03 and CL-06 are raised	CL-03 CL-06	OK

8.3	Are values of the ex-ante parameters / monitoring parameters selected correctly and conservative in accordance to methodology or tools? See the NOTE in section 3.6.1 above!	/P01/ /B13/	DR	All the ex-ante values are taken in line with the requirements of the methodology. However certain parameters used to determine rating of the bio-digester is not correct. CAR-10 is raised	CAR-10	OK
8.4	Is the measurement equipment for each parameter described and deemed appropriate? Are the locations of all measurement equipment clearly identified and consistently described, incl. process flow-charts contained in the PDD?	/P01/ /B13/	DR	Since it's a community based project, the volunteers in the village is responsible for the safe operation of the bio-digester. The operation of the bio-digester will be monitored on daily basis through log records which is then transferred to TRISLE software. There is no specific measuring equipment involved for monitoring. Nevertheless CL-03 is raised.	CL-03	OK
8.5	Is the measurement accuracy addressed and deemed appropriate?	/P01/ /B13/	DR	PP has planned to monitor the parameters through annual sampling as per the methodology.	Ok	OK
8.6	Are procedures in place on how to deal with erroneous measurements and are the corrective actions identified?	/P01/ /B13/	DR	Yes, procedures are in place for both erroneous measurements and corrective action. The same has been confirmed by interviewing FCN and CROSS.	Ok	OK
8.7	Is the frequency of measurement identified and deemed appropriate?	/P01/ /B13/	DR	Yes the frequency identified is deemed acceptable. Daily monitoring of the biogas digester operation and annual survey for other parameters are acceptable.	Ok	OK
8.8	Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/P01/ /B13/	DR	Yes the monitoring plan documented according to the approved methodology.	Ok	OK
8.9	Are the sampling, measurement methods and procedures defined?	/P01/ /B13/	DR	Detailed sampling methods and selection criteria are missing for the ex-post monitoring parameters in the PDD. CL-06 is raised.	CL-06	OK
8.10	Are procedures identified for maintenance of monitoring equipment and installations?	/P01/ /B13/	DR	Yes, clear procedure has been identified for maintenance and monitoring of the installed equipment in the project activity.	Ok	OK

8.11 Are the equipment calibration intervals identified and justified?	/P01/ /B13/	DR	calibration is required for the monitoring equipment's , since the monitoring of parameters are based on sampling procedure which requires field visit to the households and recording the actual data by filling questionnaires.	Ok	OK
8.12 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/P01/ /B13/	DR	The only parameter which is monitored daily is the usage of bio-digester for cooking and heating. The field workers are involved in the monitoring of this parameter. The recorded data will be transferred to TRISTLE software. The same has been confirmed by the interview with the PP and FCN. CL-03 is raised.	CL-03	OK
8.13 Are the monitoring arrangements described in the monitoring plan feasible within the project design?	/P01/ /B13/	DR	Most of the monitoring parameters will be monitored on continuous basis by the project proponent CROSS. NGO team formulates one team among the households participating in the project activity to monitor and report the operational status of the biogas units to the CROSS. Parameters such as annual operational hours of usage and the consumption of Nonrenewable biomass if any will be determined through the annual survey. Hence the monitoring plan declared in the PDD is found to be feasible.	Ok	OK
8.14 Are the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, sufficient to ensure that the emission reductions achieved by / resulting from the project activity can be reported ex post and verified?	/P01/ /B13/	DR	Yes, the data management, quality assurance and quality control procedure are mentioned in the PDD. A dedicated operation and maintenance manual will be prepared for the project activity for the purpose. The emission reduction achieved by the project activity is verifiable	Ok	OK
8.15 Do the PPs make provisions for personnel training needs?	/P01/ /B13/	DR	Yes, the PP make provision for training the masons involved during the construction of bio-digesters, because only qualified mason can built a good digester which will function properly.	Ok	OK

8.16	Is the authority and responsibility of overall project management clearly described?	/P01/ /B13/	DR	CROSS is the authorized and responsible for project management and emission reduction.	Ok	OK
8.17	Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/P01/ /B13/	DR	Yes, procedures are identified for emergency preparedness in case of unintended emissions.	Ok	OK
8.18	Are procedures identified for review of reported results/data?	/P01/ /B13/	DR	Yes, internal review has been proposed for the reported results and data.	Ok	OK
8.19	Is the data archiving period for this project activity stated in the PDD and appropriate?	/P01/ /B13/	DR	Yes the data will be achieved for 2 years after the crediting period which is mentioned in the webhosted PDD	Ok	OK
8.20	Is the monitoring parameters for all project emissions captured ?	/P01/ /B13/	DR	No project emissions are calculated for the project activity. Which is in line with the methodology	Ok	OK
8.21	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/P01/ /B13/	DR	Yes, the Monitored Data to be kept for a minimum of two years after the end of the crediting period or the last issuance whichever is later. The same has been mentioned in the PDD.	Ok	OK
8.22	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/P01/ /B13/	DR	As per para 10 (a) of AMS-I.E, version 04, the diversion of non-renewable biomass saved under the project activity by non-project households is considered as leakage. The PP has chosen a net to gross adjustment factor of 0.95 as per the methodology to account for leakages. The value is fixed for the first crediting period and thus no survey is required to monitor the parameter. In addition, the project doesn't involve any transfer of project equipment from or to the project activity. Leakage as per AMS-I.E, has been presented in the PDD. The same is verified and found to be valid and correct.	Ok	OK
8.2 Monitoring of the leakage						

8.2.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/P01/ /P07/ /B13/	DR	Please refer 8.2.1	OK	OK
8.2.2 Is the choice of project leakage indicators made according to selected methodology in a reasonable and conservative manner?	/P01/ /P07/ /B13/	DR	Please refer 8.2.1	OK	OK
8.2.3 Is the measurement method clearly stated and deemed appropriate for each leakage value?	/P01/ /P07/ /B13/	DR		OK	OK
9. Sustainable development(VVM V E.8)					
9.1 Does the LoA from the Host country DNA contain the confirmation that the proposed CDM project activity contributes to the sustainable development of the host Party?	/P01/	DR	LOA not submitted.	CAR-01	OK
9.2 If PDD indicates any additional environmental benefits of the project, other than GHG emission reductions, were those benefits properly substantiated?	/P01/	DR	Yes.	OK	OK
10. Stakeholders' consultation and comments (VVM V E.9)					
10.1 Were the stakeholders identified in appropriate and complete manner?	/P01/ /P31/ /P32/	DR,I	Yes the stakeholders are identified in appropriate and complete manner.	OK	OK
10.2 Are the identified stakeholders plausible?	/P01/ /P31/ /P32/	DR,I	Yes the identified stakeholder is plausible.	OK	OK
10.3 Does PDD describe the means being used to invite local stakeholder's comments?	/P01/ /P31/ /P32/	DR,I	Yes the PDD describe the means being used to invite local stakeholder's comments.	OK	OK

10.4 Were those means appropriate?	/P01/ /P31/ /P32/	DR,I	Yes	OK	OK
10.5 Was the project presented to the stakeholders in unbiased manner?	/P01/ /P31/ /P32/	DR,I	Yes	OK	OK
10.6 If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/P01/ /P31/ /P32/	DR,I	Not required.	OK	OK
10.7 Is a summary of the stakeholder comments provided in the PDD?	/P01/ /P31/ /P32/	DR,I	Yes	OK	OK
10.8 Has due account of any stakeholder comments been taken by PPs and reflected in the PDD?	/P01/ /P31/ /P32/	DR,I	Yes	OK	OK
11. Environmental impacts(VVM V E.10)					
11.1 Is the documentation supplied by the PPs regarding environmental impacts relevant and accurately reflected in the PDD?	/P01/ /B25/	DR	No, there are no Host Country requirements as it is a small scale project. This is in line with the EIA notification of the Ministry of Environment and Forests, GOI, 2006.	OK	OK
11.2 Is an environmental impact assessment (EIA) required for the CDM project activity?	/P01/ /B25/	DR	Refer 11.1	OK	OK
In case an EIA is required, has the EIA has been approved by local authorities and is the outcome accurately reflected in the PDD?	/P01/ /B25/	DR	Refer 11.1	OK	OK

11.4 Does the PDD include a brief description of the environmental effects of the project, including transboundary?	/P01/ /B25/	DR	Refer 11.1	OK	OK
11.5 Are those effects properly addressed in the design of the project activity?	/P01/ /B25/	DR	Refer 11.1	OK	OK
11.6 Does the project comply with environmental legislation in the host country?	/P01/ /B25/	DR	Refer 11.1	OK	OK

Table 2: List of Requests for Corrective Action (CAR) and Clarification (CL)

No.	CAR/CL	Observation (CAR/CL)	Reference	Summary of project owner response	Validation team conclusion
1	CAR 01	<ol style="list-style-type: none"> Letter of Approval from the host party has not been submitted MOC is not submitted 	/1.1/ to /1.7/, /2.2/ to /2.4/	PP response #1: <ol style="list-style-type: none"> The Letter of Approval from the host country was issued on 16th August 2012. Kindly find enclosed the Letter of Approval for the project activity. Kindly find enclosed the MoC for the project activity. 	DOE assessment#1:P03/, /P04/ <ol style="list-style-type: none"> The Ministry of Environment & Forests, Government of India, has accorded approval of voluntary participation for the project “Micro Scale Biogas CDM Project of CROSS” and has confirmed that the project contributes to sustainable development in India as per their letter no. 4/12/2012-CCC/HCA/ dated 2012-08-16 addressed to the Director of CROSS. The name of project participants, project title and location of project activity mentioned in the HCA are consistent with the details in the PDD. The letter was submitted by the CROSS/FCN to the DOE for review as hard copy and confirms that the corresponding party is a party to Kyoto Protocol The project is a voluntary initiation in proposed CDM project activity and un-conditional.

						<p>5. The project meets all the sustainable criterion as mentioned by the host country.</p> <p>6. Modalities of communication dated 2012-09-25 has been submitted and found to be valid.</p> <p>CAR-01 is closed successfully.</p>
2	CAR	02	The PDD lacks information on major technical aspects and implementation. Also the selection criteria for the implementation of biogas digester in the households are not defined in the PDD.	/4.1/, /4.2/	<p>PP Response#1: The information on major technical aspects and implementation has been described in the revised PDD. The selection criteria for the implementation of biogas digester in households is owning cattle and space near their home to build biogas. This is included in the revised PDD. Kindly find enclosed the revised PDD.</p>	<p>DOE Assessment#1: /P02/, /P20, /I-01/, /I-02/ Revised PDD include details of technical specification of the bio-digester and bio-gas cook stove. In addition, the criteria for the selection of households for the proposed project is mentioned and found to be acceptable which was confirmed during the interview with the PP and the consultant. Based on the review of publicly available information the technical specifications have been verified. CAR-02 is closed successfully</p>
3	CAR	03	There is no remote sensing data showing depleting carbon stocks in the project area provided either in the PDD or submitted as supporting evidence since 1989. Also the detailed calculation on decrease in carbon stock is not provided	/5.4.4/	<p>PP Response#1: The study only describes that deforestation was observed in the study area due to anthropogenic activity resulting in changes such as the reduced vigour of forest vegetation, urbanization, mining, etc. The study only gives changes in area, without describing the growing</p>	<p>DOE Assessment#1: /P02/ According to the PP's explanation DOE has reviewed the study and realised that the study did not describes the changes in the carbon stock. Hence PP has removed the same from the revised PDD and justified the</p>

					stock or carbon stock. Hence the indicator has been deleted from the revised PDD.	other two options a) <i>A trend showing an increase in time spent or distance travelled for gathering fuelwood, by users (or fuel-wood suppliers) or alternatively, a trend showing an increase in the distance the fuel-wood is transported to the project area and</i> b) <i>Increasing trends in fuel wood prices indicating a scarcity of fuel-wood; which is in line with the methodology.</i>
4	CAR	04	The paragraph referred under section B.3, project boundary description of the PDD for the methodology AMS-I.E is not correct.	/5.3.1/	PP Response#1 The paragraph referred under section B.3. project boundary description of the PDD for the methodology AMS-I.E has been changed. Kindly find enclosed the revised PDD with corrections.	DOE Assessment#1: The reference to the paragraph of the applied methodology AMS-I.E has been rightly applied now in the revised PDD. The same is verified and found to be correct. CAR-04 is closed successfully.
5	CAR	05	The PDD doesn't describe how the national and sectoral policies, macro-economic trends and political aspirations relevant to the baseline scenario.	/5.4/6/	PP response#1 There are no mandatory national and sectoral policies or regulations for use of biogas (renewable energy) and to capture methane from cattle dung at household level. This is included in the revised PDD.	DOE assessment#1:/P02/ As per the local expertise, there are no mandatory national and Sectoral policies for the promotion of Biogas in India. The explanation provided by the PP is found to be valid and found to be mentioned in the revised PDD. CAR-05 is closed successfully.
6	CAR	06	Please ensure for SI units should be		PP response#1:	DOE assessment#1:/P02/

			mentioned in all applicable places or the conversion details shall be mentioned		The PDD has been corrected to SI units wherever applicable in the revised PDD.	DOE has reviewed the revised PDD and found that all the units are corrected to SI units. Hence CAR-06 is successfully closed.
7	CAR	07	The units mentioned for the quantity of biogas consumed for a 4'' burner is not correct.	/5.5.1/	PP response#1: The unit for the quantity of biogas consumed has been revised from m ² /hr to m ³ /hr, which is a typographic error.	DOE assessment#1:/P02/, /P20/ The unit has been corrected to m ³ /hr. It is verified in the ER Calculations Sheet and revised PDD. CAR-07 is closed successfully.
8	CAR	08	Source of emission sources due to the project activity documented is not inline with the methodology AMS I.E		PP response#1: The source of emissions due to project activity has been corrected in the revised PDD to be in line with the methodology AMS I.E.	DOE assessment#1: Source of leakage emissions has been corrected in the revised PDD which is in line with the methodology AMS I.E version 04. CAR-08 is closed.
9	CAR	09	PDD is not clear in the monitoring of the parameter No-Renewable biomass used by the users in the project region. Make it consistent everywhere in the PDD		PP response#1: The use of non renewable biomass under leakage will not be monitored as the default value of 0.95 has been applied to account for it. This has been corrected to be consistent in the revised PDD.	DOE assessment#1: Revised PDD has been updated with the revised monitoring plan. PP. has fixed the monitoring parameter "No-Renewable biomass used by the users in the project region" ex-ante and will not be changed during the first crediting period DOE has verified the PDD and confirms that the default value of 0.95 applied is appropriate and is inline with the methodology AMS I.E version

						04. Hence CAR-09 is successfully closed.
10	CAR	10	Calorific value of biogas in a digester (Hb) mentioned in the webhosted PDD is not correct.	/4.7/	PP response#1: Calorific value of biogas in a digester (Hb) has been updated in the revised ER calculations sheet.	DOE assessment#1: /P02/,/P20/,/P08/ The heat of combustion per unit volume of biogas value has been changed from 22.1 MJ/m ³ to 21.6 MJ/m ³ as per B.T. Nijaguna report. The value considered is for methane content of 60% in the biogas. The value considered is found to be valid and correct. CAR-10 is closed
11	CAR	11	Abbreviation is not mentioned in the PDD.		PP response#1: List of abbreviations are included in the PDD.	DOE assessment#1: List of abbreviations have been included in the revised PDD and checked to be ok. CAR-11 is closed.
12	CAR	12	Annex 3 of the PDD reads that following parameters have been determined in the baseline survey conducted in the project region 1. The amount of waste or raw materials that decays anaerobically 2. Manure management practiced currently in each of the household in the baseline scenario But no such information is available in the baseline survey data provided to the DOE. Clarify?	/5.4.3.1/	PP response#1: The demographic data was collected for biomass use and the type of manure management in the baseline. As the demographic survey showed that manure management was essentially aerobic, it was not considered for methane avoidance. Hence the baseline data is presented only for biomass use and not manure management.	DOE assessment#1:/P02/,/P07/ Since the baseline of the project is the only the utilization of non-renewable biomass amount waste water and Manure management practices are not relevant for the project case. Hence Explanation provided by the PP is deemed appropriate. PP. has removed the irrelevant data from the revised PDD. CAR-12 is closed.

13	CL	01	The feed material for the biodigester is not consistently mentioned in the PDD. Please clarify.		PP response#1: The feed material for the biodigester is cattle dung. This has been consistently maintained in the revised PDD.	DOE assessment#1: The feed material is corrected to cattle dung and the same is mentioned consistently throughout the revised PDD. The same was verified during the site visit. CL-01 is closed successfully.
14	CL	02	Please Provide proof for the operational lifetime of a biogas unit.		PP response#1: The proof of operational lifetime of a biogas unit is provided in C.1.2.	DOE Assessment#1: /B29/, /P11/ The lifetime of a fixed dome biogas unit Includes Deenabandhu model as per Food and Agricultural Organization was reviewed, wherein the operating lifetime of a biogas unit is given as 20 to 50 years/B29/. In addition the DOE has reviewed life time based on the AFPRO report which mention the life time as 25 years or more/P24/. Since the Proposed biogas technology Deenabandhu Model is also fixed drum model and hence the assumed life time of 25 years considered in the PDD is valid and correct. CL-02 is closed successfully.
15	CL	03	As per the discussion and interview during the site visit, the explanation on PDD about online monitoring is not correct.		PP response#1: The monitoring solution is not online, but a stand alone monitoring solution to monitor all the processes of CDM activity. This has been corrected in the revised PDD.	DOE Assessment#1: The term 'online monitoring' is removed in the revised PDD. As per the discussion with the PP and the consultant, the field workers/volunteers will note down the information from the

						project users in the form of log records and provide the information to data entry operators to enter the data in TRISTLE software. Hence the same will be shared with the DOE during project verification. Thus proper monitoring procedures are in place for the project activity. CL-03 is closed successfully
16	CL	04	Explanation on methodological choice of emission reduction not clearly mentioned in the Section B.6.1. The explanation is not in line with requirement of “Guidelines For Completing The Simplified Project Design Document(CDM-SSC-PDD)”	/4.1/	PP response#1: The methodological choice of emission reduction for I.E has been explained in section B.6.1 in the revised PDD as per the guidelines for completing the simplified CDM-SSC-PDD.	DOE Assessment#1: /B12/, /P02/ Guidelines for completing the simplified CDM-SSC-PDD have been followed in the revised PDD. The information provided in section B.6.1 is reviewed and found to be OK. CL-04 is closed successfully
17	CL	05	Para 7 of EB 54, Annex 13 is nowhere referred under section A.4.5 of the PDD. Please clarify.	/4.8/	PP response#1: The relevant section of Para 7 of EB 54, with regard to de-bundling has been included under section A.4.5 of the PDD.	DOE Assessment#1: /P02/ De-bundling check has been applied for Type-I for the proposed project and thus satisfies the stipulations provided in EB 54, Annex 13. Thus the project is not a de-bundled component. CL-05 is closed successfully.
18	CL	06	Sampling plan for the monitoring is not explained clearly in the PDD. The sampling plan should be in line with appendix 3 of EB 65 annex 2.	/5.5.5/ /8.2/	PP response#1: The sampling plan for monitoring has been included in Annex 4 of revised PDD.	DOE Assessment#1: /B30/, /P02/ The latest version of ‘Guidelines for sampling and surveys for CDM project activities and programme of activities’ has been rightly applied in the revised PDD. All

						the requirements as per EB 69, Annex 05, Version 02 has been referred correctly in the revised PDD. The DOE has reviewed the same and the procedures identified for sampling is valid and possible to implement. CL-06 is closed successfully.
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Appendix B

Certificates of Competence

Qualification

Ramalingam, Murali /

Emission Trading

United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:

(AuditorenRegNr)

Appointed:

(Zugelassen)

ja

Qualification Level: Lead Auditor

(Qualifikationsstufe)

External:

(Externer)

Add. reviewer:

(Zusätzlicher Prüfer)

EAC Scopes:

(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)

CDM 03 - Energy demand

Add. qualification:

(zus. Qualifikation)

First Appointment: 05/15/2012

(Erstberufung)

Valid to:

(Gültig bis)

05/14/2015

Remarks:

TA 1.2

TA 3.1

Languages:

Tamil

English

Qualification

MP, Kanal /

Emission Trading

United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:
(AuditorenRegNr)

Appointed: (Zugelassen)	ja	Qualification Level: (Qualifikationsstufe)	Lead Auditor
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External: (Externer)	Add. reviewer: (Zusätzlicher Prüfer)
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EAC Scopes: (EAC Branchen)	CDM 01 - Energy industries (renewable - / non-renewable sources)
	CDM 03 - Energy demand
	CDM 06 - Construction
	CDM 13 - Waste handling and disposal
	CDM 15 - Agriculture

Add.
qualification:
(zus. Qualifikation)

First Appointment: (Erstberufung)	02-06-2012	Valid to: (Gültig bis)	02-05-2015
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Remarks:	TA. 1.2, 3.1, 6.1, 13.1/13.2, 15.1
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Languages:	English
	Tamil
	Hindi

Qualification

Bellapu, Nagaraju /

Emission Trading

United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:
(AuditorenRegNr)

Appointed:
(Zugelassen)

ja

Qualification Level: Trainee
(Qualifikationsstufe)

External:
(Externer)

Add. reviewer:
(Zusätzlicher Prüfer)

EAC Scopes:
(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)
CDM 03 - Energy demand

Add. qualification:
(zus. Qualifikation)

First Appointment: 03/14/2012
(Erstberufung)

Valid to:
(Gültig bis)

03/13/2015

Remarks:

TA 1.2, 3.1

Languages:

English

Hindi

Qualification

C, Indumathi /

Emission Trading

United Nations Framework Convention on Climate Change

Auditor No.:

(AuditorenRegNr)

Appointed:
(Zugelassen)

☒ ja

Qualification Level:
(Qualifikationsstufe)

Lead Auditor

External:
(Externer)

☐ ja

Add. reviewer:
(Zusätzlicher Prüfer)

☒ yes

EAC Scopes:
(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)

Add. qualification:
(zus. Qualifikation)

First Appointment:
(Erstberufung)

06/06/2012

Valid to:
(Gültig bis)

05/06/2015

Remarks:

TA 1.2

Languages:

Tamil
English
Hindi

Experience Exchange

Date

Location

Remarks

Accreditation(s)

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next Monitoring:
(nächste Beurteilung)

Remarks:

History of scope allocation