GOLD STANDARD PASSPORT

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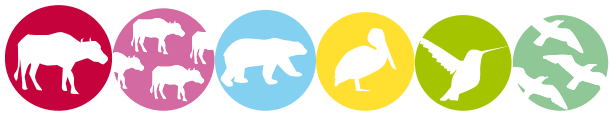

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SECTION A. Project Title

Biogas CDM Project of Bagepalli Coolie Sangha

SECTION B. Project description

The Bagepalli Coolie Sangha is a 25 year-old membership based people's organization formed by small and poor peasant families (landed and landless agricultural labourers) in their respective villages. 38,615 small and poor peasant families have formed village level Coolie Sangha Units (CSUs) in 915 villages. The Coolie Sangha is self-financed through a system of Sangha Fund contributions made by the Member families. The Coolie Sangha gives an identity and protection to its Members and supports them in issues and struggles aimed at their empowerment. The Coolie Sangha implements various grassroots planned developmental activities, including children's education, community and referral health, petty credit for Coolie women, activities to support young widows and deserted women, a village level decentralized credit activity, agricultural development, etc.

The purpose of this Biogas CDM Project activity is to set up 18,000 biogas plants (digesters) of 2 m^3 capacity each for single households in 5 Taluks of Chickballapur District[1] by the Coolie Sangha, and in this way replace Kerosene and Non-Renewable Biomass with biogas for cooking and hot water heating. A biogas plant of 2 m^3 capacity is sufficient for providing cooking fuel to a family of four to five[2]. These biogas units will be installed in a phased manner; 6,000 units/year for a period of 3 years. This is one of the most backward Districts of India and deserves a special attention and proper planning for all out development.

Each household will install a 2 m^3 biogas plant and feed cow dung, organic waste and biomass waste into the anaerobic digester. The technology is tried and tested in India, and has been in use for many years. By utilizing these various sources of biogenic waste in a controlled anaerobic digestion and combustion system, biogas will be available for cooking energy and heating hot water. The biogas will be used on a two-ring gas stove with a flame temperature of 870° C, supplied as part of the project activity. All households willing to collect biogenic waste from agriculture and household can participate in the project. The list of 18,000 suitable and interested households is

[1] 6 taluks of former Kolar district have been separately and named Chickballapur district. Chickballapur district was carved out of Kolar district on 23th August 2007 (http://chikballapur.nic.in/district_profile.html). The 6 taluks includes Gowribidanur, Gudibanda, Bagepalli, Chintamani, Sidlaghatta and Chickballapur taluks. Many of the discussions in the PDD are done for Kolar District, as statistics have been compiled for the formerly Kolar District, which is inclusive of the project area.

[2] http://www.techno-preneur.net/technology/New-technologies/Energy/biogas.htm

given in Appendix 1 (Excel sheet provided to DOE). Implementation of the project depends on the successful validation and registration of the project as a CDM project activity since the project will be financed completely from carbon revenues. There are social, environmental, economic and technological benefits which contribute to sustainable development.

Social benefits:

- Avoided health hazards associated with unmanaged waste in back yards and village streets
- Avoided health hazards from indoor air pollution; and reduced drudgery

Environmental benefits:

- Avoided local environmental pollution through a better waste management system; and soil improvement by providing high quality manure
- Avoided global and local environmental pollution and environmental degradation by switching from kerosene and non-renewable biomass to renewable energy, leading to reduction of GHG emissions

Economic benefits:

- Savings to national economy by providing renewable cooking fuel instead of fossil fuels
- Higher productivity of workers as they have adequate cooking fuel supply

Technological benefits:

- Better biogas digester models, thus improving biogas yield.
- Training in chemistry of biogas for masons and users leading to improved scientific temper in community and more jobs.

The project was registered as a CDM project on 28th August 2009[3]. The details of the project activity is as follows:

Project title	Biogas CDM Project of Bagepalli Coolie Sangha
Host Parties	India
Authorized Participants:	Bagepalli Coolie Sangha (BCS)
Other Parties Involved	n/a
Sectoral scopes	1 : Energy industries (renewable - / non-renewable sources)
Activity Scale	SMALL
Methodologies Used	AMS-I.C. ver. 13 - Thermal energy for the user with or without electricity AMS-I.E. - Switch from Non-Renewable Biomass for

[3] http://cdm.unfccc.int/Projects/DB/DNV-CUK1242729511.7/view

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	Thermal Applications by the User
Amount of Reductions	42,855 metric tonnes CO_2 equivalent per annum
Registration Date	28 Aug 09
Crediting Period	01 Jan 10 - 31 Dec 16 (Renewable)

The estimated start date of construction is 1st week of February 2010.

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SECTION C. Proof of project eligibility

C.1. Scale of the Project

Project Type	Large	Small
	☐	☑
	☐	☐
	☐	☐
	☐	☐
	☐	☐

	☐

C.2. Host Country

India

C.3. Project Type

Project type	Yes	No
Does your project activity classify as a Renewable Energy project?	☑	☐
Does your project activity classify as an End-use Energy Efficiency Improvement project?	☐	☑

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Please justify the eligibility of your project activity:

The chosen type and category is TYPE I - RENEWABLE ENERGY PROJECTS, I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, version 01, EB 37 and TYPE – I – RENEWABLE ENERGY PROJECTS, I.C. Thermal energy for the user with or without electricity, Version 13, EB 38. The chosen technology is a domestic biogas plant. It is a small thermal appliance that displaces the use of kerosene and non-renewable biomass by introducing a system for utilising renewable biomass and converting it into renewable energy by means of a digester in which the substrate undergoes acidification and methanation. This end-user technology involves the switch from kerosene and non-renewable biomass to a renewable source of energy. Biogas is included in the specified methodology as an example of a suitable end user technology: biogas stoves are deemed a measure that involves the switch to renewable biomass from fossil fuel (kerosene) and non-renewable biomass in the baseline.

Technology/measure

Biogas is a mixture of methane and carbon dioxide. It also has traces of hydrogen sulphide, ammonia, oxygen, hydrogen, water vapour etc., depending upon feed materials and other conditions. Biogas is generated by fermentation of cellulose rich organic matter under anaerobic conditions. In anaerobic conditions, the methane-producing bacteria become more active. Thus, the gas produced becomes rich in methane. The optimum utilization depends upon the successful physical installations, which in turn depend upon plant design and its selection. The basic conversion principle is that when a non-ligneous biomass is kept in a closed chamber for a few days, it ferments and produces an inflammable gas. The anaerobic digestion consists of three stages:
I Hydrolysis
II Acid formation
III Methane fermentation

The processes are carried out by two sets of bacteria namely acid forming bacteria and methane formers. The acidogenic phase I is the combined hydrolysis and acid formation stages in which the organic wastes are converted mainly into acetate, and phase II is the methanogenic phase in which methane and carbon dioxide are formed. The better the three stages merge with each other, the shorter the digestion process. A valve ensures that no gas flows to the stove when the stove is not lit.

Users prepare batches of slurry in the mixing tank, before allowing the final mixture to flow into the digester for methane formation phase. After digestion, evacuated slurry may be re-used in the process. The recovered gas is combusted and used for cooking and water heating. The chosen methane recovery and combustion system is the time tested Deenabandhu model biogas technology which is well-known in India. The project activity will organise the 18,000 users to collect biogenic household and agricultural waste and utilise it in individual household methane recovery systems. The 18,000 individual plants consist a mixing chamber where waste water, cow dung and leachate from organic waste are mixed, an inlet pipe to feed the slurry into the reactor, the main biogas reactor / digester where methane formation / recovery takes place, a slurry outlet pipe, an outlet chamber, and a slurry platform. The outlet pipe and tank are provided to remove the digested / treated sludge or fermentation residue, and the slurry platform is provided to maintain the treated slurry in clean condition and allow it to be recycled back into the digester.

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Pre Announcement	Yes	No
Was your project previously announced?	☐	☑
The project was not previously announced to go ahead without the revenues from carbon credits. The project is in fact going to be implemented only with CER revenue.		

C.4. Greenhouse gas

Greenhouse Gas	
Carbon dioxide	☑
Methane	☐
Nitrous oxide	☐

C.5. Project Registration Type

Project Registration Type	
Regular	☑

Pre-feasibility assessment	Retroactive projects (T.2.5.1)	Preliminary evaluation (eg: Large Hydro or palm oil-related project) (T.2.5.2)	Rejected by UNFCCC (T2.5.3)
	☐	☐	☐

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SECTION D. Unique project identification

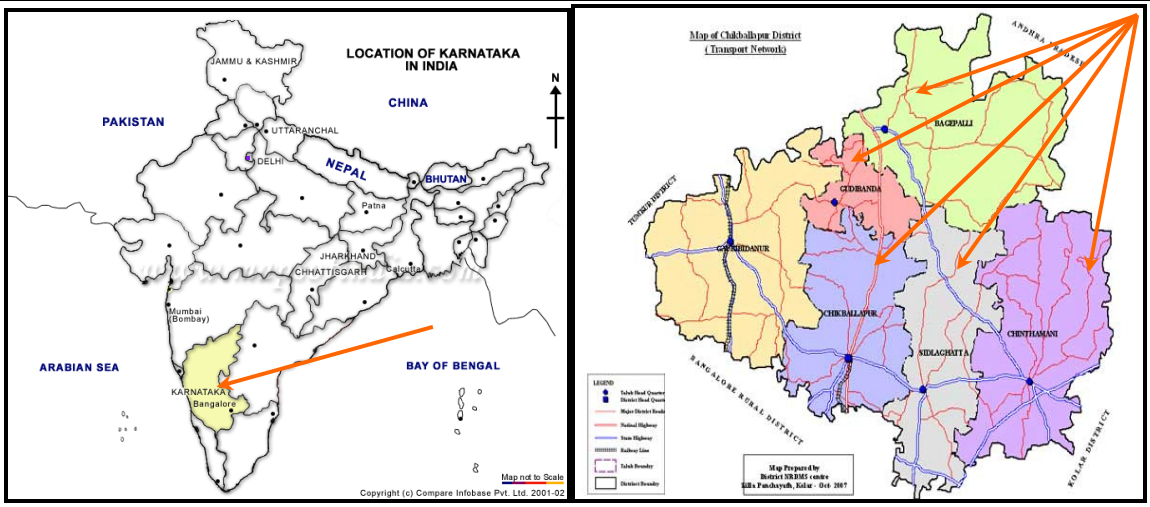
D.1. GPS-coordinates of project location

Taluk	Coordinates
Bagepalli	13° 47' 5" North 77° 47' 35" East
Chickballapur	13° 26' 3" North 77° 43' 27" East
Chintamani	13° 24' 0" North 78° 4' 0" East
Gudibanda	13° 40' 10" North 77° 41' 54" East
Sidlaghatta	13° 23' 17" North 77° 51' 46" East

Explain given coordinates

The villages selected for the project is different from the villages in which the Bagepalli Biogas Project has been implemented. A list of the villages different from that implemented for the Bagepalli Biogas Project has been provided to the DOE during Validation.

D.2. Map



Map showing Karnataka State and the 5 taluks in Chickballapur district where the project will be implemented

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SECTION E. Outcome stakeholder consultation process

E.1. Assessment of stakeholder comments

Stakeholder comment	Was comment taken into account (Yes/ No)?	Explanation (Why? How?)
When will the 18,000 biogas plants start to be built?	Clarification	After ERPA will be signed and funding would be available for construction.
What will be the role of CSU members towards non-CSU biogas users be?	Clarification	The neighbouring CSU will select the non-CSU villages and they will take the responsibility of monitoring the biogas units in non-CSU villages.
Will all the 18,000 units be built in the same year?	Clarification	It will be phased over the next 3 years @ 6000/year.
What will be the investment for the 18,000 biogas units?	Clarification	About 34.45 crores will be the investment.
What other substrate can be used for producing biogas?	Clarification	Dung is compulsory. Along with that, silk cocoon waste and other organic waste can be included.
Can the biogas be used for lighting?	Clarification	We have not used the technology so far. But we will consult an expert and let you know.
Will the biogas size be the same as the previous Bagepalli CDM project?	Clarification	It will be the same dimension of 2 cum as implemented in the previous CDM project by ADATS.
Who and how is the CER calculations done?	Clarification	The emission from burning fuelwood which is going to be replaced by biogas is the emission reductions or CERs. Our CDM consultant will do the calculations.
What will be the agreement of the 18,000 biogas units?	Clarification	After the first 9 years, the CER revenue will be distributed to the communities.
Will women be trained for masonry for building biogas?	Clarification	There are 2 biogas masons in Bagepalli. You can get training from them.
If the beneficiary of the end user agreement with BCS dies, who will be the next beneficiary?	Clarification	The nearest relative will be the next beneficiary. Documentary proof of death certificate and User agreement has to be provided.
Will the money be given only to	Clarification	Yes

the beneficiary of the biogas unit?		
How the investors are benefited by this project?	Clarification	They buy the CERs that we generate from this project to meet their emission reduction targets.
What material will be given from the office for construction of the biogas unit?	Clarification	700 bricks, 10 bags cement, 1 tractor load sand, 200 kgs jelly stones, biogas stove, 20 metres pipe and gate valve.
Will biogas plant built about 150 metres away from the kitchen have enough biogas?	Clarification	Gas will be available but maintenance will be a problem.
Will the biogas units constructed above the ground produce biogas?	Clarification	Gas will be produced but the life of the biogas plant will be very less.
What type of biogas unit is going to be built – plastic doom or cement doom?	Clarification	Fixed doom – with cement; This is long lasting compared to plastic doom.
Why is the biogas units not built for sangha members in the villages where there is Bagepalli CDM biogas units?	Clarification	Not allowed as stated in the PDD.
Who will bear the cost for building biogas?	Clarification	The biogas will be built completely from CDM finance. The total cost per biogas is Rs.12,500. Labour will be given to the household. There will be no costs to the communities.
How will the rest of the households in the villages having Bagepalli CDM biogas plants be benefited?	Clarification	We are trying to implement other projects like Improved Cook Stoves.
If we do not have cows, will we not be given biogas?	Clarification	Only those families who have cattle and enough space for biogas construction, will be provided with biogas.
Will there be any side effects of cooking with biogas?	Clarification	No side effects. You can see that from the 5,500 biogas units constructed under the Bagepalli Biogas Project.
Will a bigger biogas unit be built for bigger families?	Clarification	No, it will be standard size of 2 cum. If the dung is fed properly, there will be enough biogas for the family.
What will be the ID numbers for non coolie sangha members?	Clarification	New ID numbers will be given.
Can biogas units be built for those staying in huts?	Clarification	Yes, if there is space and cattle.

When we add the slurry to the fields will it have an impact?	Clarification	Yes a positive effect; there will be an increase in crop productivity.

E.2. Stakeholder Feedback Round

Please describe report how the feedback round was organised, what the outcomes were and how you followed up on the feedback.

SECTION F. Outcome Sustainability assessment

F.1. 'Do no harm' Assessment

Safeguarding principles	Description of relevance to my project	Assessment of my project risks breaching it (low, medium, high)	Mitigation measure
1. Human Rights	No human rights will be violated	Low	No mitigation measures are required
2. Labour Standards	No labour standards will be violated	Low	No mitigation measures are required
3. Environmental Protection	No environmental protection standards will be violated	Low	No mitigation measures are required

No mitigation measures are required for the project activity as no human rights, labour standards and environmental standards will be violated.

- The project will respect internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people. The project will not be complicit in Human Rights abuses.
- The project does not involve and is not complicit in involuntary resettlement.
- The project does not involve and is not complicit in the alteration, damage or removal of any critical cultural heritage
- The project will respect the employees' freedom of association and their right to collective bargaining and is not complicit in restrictions of these freedoms and rights
- The project does not involve and is not complicit in any form of forced or compulsory labour
- The project does not employ and is not complicit in any form of child labour
- The project does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis.
- The project will provide workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.
- The project will take a precautionary approach in regard to environmental challenges and is not complicit in practices contrary to the precautionary principle.
- The project does not involve and will not be not complicit in significant conversion or degradation of critical natural habitats, including those that are (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value, or (d) recognized as protected by traditional local communities.
- The project does not involve and is not complicit in corruption. The project will not have any element of corruption as it will be handled by the BCS themselves.

F.2. Sustainable Development matrix

Indicator	Mitigation measure	Relevance to achieving MDG	Chosen parameter and explanation	Preliminary score
Gold Standard indicators of sustainable development	If relevant, copy mitigation measure from 'Do No Harm' assessment, and include mitigation measure used to neutralise a score of '-'	Check www.undp.org/mdg and www.mdgmonitor.org Describe how your indicator is related to local MDG goals	Defined by project developer	Negative impact: score '-' in case negative impact is not fully mitigated, score '0' in case impact is planned to be fully mitigated No change in

				impact: score '0' Positive impact: score '+'
Air quality	No mitigation measures required	**MGD No.7** -Reduction in indoor air pollution -Improvement in health of women	- No. of biogas units constructed and operating - Deduction in incidence of health problems due to better indoor air quality	+
Water quality and quantity	No mitigation measures required	- Quantity of water saved	- Water saved compared to baseline as perceived by the communities	+
Soil condition	No mitigation measures required	-Application of slurry to the fields -Decrease in use of chemical fertilizer	Comparison of NPK content of soil treated with slurry and dung -Community's response to the use of chemical fertilizer after slurry application to fields	+
Other pollutants	No mitigation measures required	- Decrease in pathogens due to conversion of dung to slurry	Quantity of pathogens in slurry compared to that of dung	+
Biodiversity	No mitigation measures required	-Due to less dependence on fuelwood, there would be better regeneration of trees, shrubs and herbs in the forests and non-forest areas. But it would be very difficult to assess the impact of the project activity alone on biodiversity.	-Though there would be a definite positive impact, it would be difficult to assess quantitatively.	0
Quality of employment	No mitigation measures required	**MGD No.1** - Creation of new business venture especially for supply of material to the project activity. - Employment for masons and helpers; - Better quality of work to the local communities. -Involvement of CSU members in daily monitoring	Improvement in quality of jobs compared to baseline.	+
Livelihood of the poor	No mitigation measures required	**MGD No.3** - Avoidance of drudgery -Convenience to the family -Better social environment at home	Improvement in living conditions especially of women in the family as perceived by the communities	+

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Access to affordable and clean energy services	No mitigation measures required	-Presence, affordability of services and reliability of services of biogas units -Reducing dependence on biomass and kerosene	No. of biogas units constructed and operating	+
Human and institutional capacity	No mitigation measures required	**MGD No. 2** -Empowerment of women and the Coolie members - Children can attend school in time -Skill development and institutional capacity	Improvement in human and institutional capacity as perceived by the communities	+
Quantitative employment and income generation	No mitigation measures required	**MGD No.1** - Employment generated in the informal sector -Income from CERs	Income generation at family level due to the project activity, as perceived by the communities	+
Balance of payments and investment	No mitigation measures required	**MGD No.8** -Investment to the project through forward funding of CERs -Decrease in use of kerosene	-Foreign revenue for the project	+
Technology transfer and technological self-reliance	No mitigation measures required	-Technical and awareness training programs will be conducted for the communities in proper operation and management of the biogas digester, system as well as correct methods and timing of biogas liquid and residue application in agricultural fields.	However, there is no any technology transfer.	0

Justification choices, data source and provision of references

A justification paragraph and reference source is required for each indicator, regardless of score

Air quality	In the baseline, cooking from the unprocessed solid fuels release at least 50 times more noxious pollutants than gas. The incomplete combustion of biomass releases complex mixture of organic compounds, which include suspended particulate matter, carbon monoxide, poly organic material, poly aromatic hydrocarbons, formaldehyde, sulphur, trace metals etc. that cause many health hazards such as respiratory infections, eye infections, otitis media, chronic obstructive pulmonary diseases, lung cancer, pulmonary tuberculosis, cataract and also adverse pregnancy outcome[4,5]. According to WHO and Smith *et al.*, 2004 study, indoor smoke is the third health risk factor among Indians[6]. Implementation of the project will eliminate indoor air pollution, as biogas is colourless and burns with a clean blue flame similar to that of liquid petroleum gas allowing for virtually smoke free combustion, thus reducing health hazards considerably[7].
Water quality and quantity	There will be a decrease in the quantity of water used for washing vessels after implementation of the project. The vessels will not be covered with soot like in the baseline when fuel wood is used for cooking purposes, requiring more water to scrub and clear the vessels. As mentioned by Mahadevamma, Chickkannanahalli in Tumkur district of Karnataka, "Now the vessels do not get

[4] http://www.icmr.nic.in/bumay01.pdf

[5] http://ehs.sph.berkeley.edu/krsmith/publications/2009%20pubs/Smith-Sivertsen%20et%20al.%20AJ%20Epi%2009.pdf

[6] http://whqlibdoc.who.int/hq/2002/WHO_WHR_02.1.pdf

[7] http://practicalaction.org/docs/energy/docs50/bp50-nepal-biogas.pdf

	blackened due to cooking, leading to savings in time and requirement of less water in cleaning of vessels"[8]
Soil condition	The slurry manure is considered far more superior to farm yard manure in respect of NPK content. It will reduce the use of chemical fertilizers to a certain extent. A Government of India study showed that over 70% households perceived an improvement in crop production as a result of applying slurry manure in the fields and savings by reduced fertilizer usage @Rs.185/month[9]. The application of slurry improves the physical, chemical, and biological characters of the soil[10]. Balasubramanian and Kasturi Bai[9] evaluated nutrient status of slurry and observed a 70% increase compared to the influent and observed an increase in biomass production after application[9].
Other pollutants	The slurry has lesser number of pathogens compared to dung. Most of the disease-causing organisms are killed. This serves as an effective control of parasitic diseases, hookworm, roundworm, etc[11]. There is reduction of pathogens after digestion[9,12]. Mosquitoes and flies do not breed in digested slurry and thus biogas improves sanitation.
Biodiversity	Fuel wood collection and consumption are intricately linked to degradation of natural resource management. Demand for fuel wood from commons and forests cause resource degradation[13]. A single biogas system with a volume of 2.8 m^3 can save as much as 0.12 ha woodland each year[14]. Though empirical evidences show an improvement in biodiversity due to implementation of the project, this has not been considered. It will be difficult to assess quantitatively the direct impact of the project on biodiversity, unless a thorough assessment of baseline biodiversity status is undertaken. Thus this indicator is not considered.
Quality of employment	The project will create additional business opportunities to the local communities. A dignified and non-alienating employment for masons will be created with a high sense of ownership. Biogas masons from the local community will be made accountable to each and every biogas being built.
Livelihood of the poor	The project would lead to monetary savings due to avoidance of kerosene usage and lesser user of commercial fertilizer. The project would also lead to improvement in the quality of life due to reduced drudgery and time spent for women and children in fuel procurement, transporting, processing, storing and cooking time. Approximately two hours are spent in gathering biomass per day per household in the baseline[15]. Women can take up income generation activities thus alleviating poverty. Children can attend school as women are able to cook and serve breakfast to the children in time to attend school. There is also more time for leisure at homes. The national level evaluation studies also show that communities benefit from clean fuel for cooking, cleanliness of environment, improvement in the health of women, saving in manure cost, employment generation, saving in cooking time and traditional fuel[4].
Access to affordable and clean energy services	Women will have better and clearer access to energy for cooking and heating water[7]. Kerosene and fuelwood is being replaced by biogas which is clean, healthy and is easy access to energy. At the turn of a knob, they will have access to energy for cooking. While in the baseline they face hardship to collect fuel wood and also get kerosene once a month through the public distribution system.
Human and institutional capacity	The Coolie Sangha is a highly structured, disciplined and self-financed membership driven organization. The Biogas CDM Project involves implementation of the technology, maintenance and monitoring emission reduction. All the tasks and activities will be handled by the CSUs. This will lead to empowerment of women and the Coolie Sangha members. A study in Nepal shows that in terms of rural energy, women's practical needs of basic energy demands is met thus

[8] http://bioenergyindia.kar.nic.in/Newsltr_2(pg%205-8).pdf

[9] http://planningcommission.gov.in/reports/peoreport/peoevalu/peo_npbd.pdf

[10] http://www.ias.ac.in/currsci/jul10/articles13.htm

[11] http://www.greenpowerindia.org/biogas_benefits.htm

[12] http://unesdoc.unesco.org/images/0005/000528/052857eb.pdf

[13] http://www.jstor.org/pss/3147225

[14] http://www.gtz.de/de/dokumente/en-biogas-volume1.pdf

[15] Ravindranath, N.H and Hall, 1995. Biomass, Energy and Environment: A developing country perspective from India. 376 pp. New York: Oxford University Press.

	reducing their workloads and saving time in managing household energy requirements. This enables women to obtain opportunities for social and economic activities leading to fulfilling their strategic needs and enhancing their self-confidence and empowerment[16]. Children can attend school in time as food can be cooked in time for them and girls do not have to collect fuelwood anymore[17].
Quantitative employment and income generation	Construction of Biogas Units would create good employment opportunities in rural areas. It will provide regular means of livelihood to a large number of entrepreneurs and turnkey operators and provide employment to masons and daily-wage labourers. Monetary benefits from CERs will accrue to the women of the house after the initial years to the carbon investor. Women can take up income generation activities as they have time available to them[7].
Balance of payments and investment	The biogas units will be constructed from the forward CER funding. Thus there is going to be foreign direct investment into the region. The project will also reduce use of kerosene, which is currently imported into the country.
Technology transfer and technological self-reliance	-Technical and awareness training programs will be conducted for the communities in proper operation and management of the biogas digester, system as well as correct methods and timing of biogas liquid and residue application in agricultural fields. However, there is no any technology transfer. Thus there is no change in impact.

According to the EIA notification issued by the Ministry of Environment and Forests (MoEF, 2006), the project does not require Environment Impact Assessment (EIA).[18]

[16] *community.eldis.org/txFileDownload/f.59c2a4be/n.empowerment.doc*

[17] http://www.iitr.ernet.in/departments/AH/uploads/File/hshs/Presentations/Links/Technical%20Papers/Community%20Participation%20&%20SHP/Mr%20Mahendra%20Neupane_Community%20Based%20RE%20Dev.pdf

[18] http://www.envfor.nic.in/legis/eia/so1533.pdf

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SECTION G. Sustainability Monitoring Plan

No		1
Indicator		Air quality
Mitigation measure		No mitigation measure required
Chosen parameter		(a) No. of biogas units constructed and operating (b) Reduction in incidence of health problems due to better indoor air quality
Current situation of parameter		(a)No biogas units; (b) indoor air pollution causing health problems
Estimation of baseline situation of parameter		Fuelwood and kerosene is being used for cooking and hot water bath releasing pollutants causing health problems especially to women and children.
Future target for parameter		(a) Construction of 18,000 biogas units@6000/year (b) Reduces indoor air pollution; Reduces health problems especially for women and children
Way of monitoring	How	(a) Number of biogas units constructed and operating from online monitoring (b) Community's response to reduction in health problems after use of biogas
	When	(a) Extraction from online monitoring system which will be updated on daily basis (b) Annual stratified sample survey
	By who	Bagepalli Coolie Sangha/CDM Consultant

No		2
Indicator		Water quality and quantity
Mitigation measure		No mitigation measure required
Chosen parameter		Water saved compared to baseline as perceived by the communities
Current situation of parameter		Cooking with traditional fuelwood stove and kerosene results in the vessels being covered with soot requiring more water to scrub and clean the vessels.
Estimation of baseline situation of parameter		Excessive scrubbing and cleaning of vessels, requiring plentiful water to keep the vessels clean.
Future target for parameter		There will be a decrease in the quantity of water used for washing vessels after implementation of the project as the vessels will not have soot.
Way of monitoring	How	Community's' experience with biogas units through PRA technique
	When	Annual stratified sample survey
	By who	Bagepalli Coolie Sangha/CDM Consultant

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No		3
Indicator		Soil Condition
Mitigation measure		No mitigation measure required
Chosen parameter		(a) Comparison of NPK content of soil treated with slurry and dung (b) Community's response to the use of chemical fertilizer after slurry application to fields
Current situation of parameter		(a) Dung manure is used for fields. (b) Chemical fertilizers are also used for certain crops
Estimation of baseline situation of parameter		(a) Will be assessed during periodic testing of soil treated with dung (b) Chemical fertilizers are used to increase NPK content of soil
Future target for parameter		(a) Application of biogas slurry instead of dung increase NPK content of soil. (b) Community's response to decrease in use of chemical fertilizer after slurry application to soil
Way of monitoring	How	(a) Laboratory test of soil treated with slurry and dung (b) Community's' experience with biogas units through Participatory Rural Appraisal (PRA)Technique
	When	(a) Two years once for laboratory test (b) Annual stratified sample survey
	By who	(a) Certified Laboratory (b) Bagepalli Coolie Sangha/CDM Consultant

No		4
Indicator		Other pollutants
Mitigation measure		No mitigation measure required
Chosen parameter		Quantity of pathogens in slurry compared to that of dung
Current situation of parameter		Dung is left in the open which breeds a lot of pathogens
Estimation of baseline situation of parameter		Will be assessed during periodic testing of dung for load of pathogens
Future target for parameter		The pathogen load will get reduced in the slurry
Way of monitoring	How	Laboratory test of pathogen load in slurry and dung
	When	Two years once
	By who	Certified Laboratory

No	5
Indicator	Quality of employment
Mitigation measure	No mitigation measure required
Chosen parameter	Improvement in quality of jobs for the community
Current situation of parameter	(a) Women are spending a lot of time collecting fuelwood

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		(b) No biogas construction activity in the baseline
Estimation of baseline situation of parameter		(a) Time spend for collecting fuelwood (b) No jobs created due to biogas activity
Future target for parameter		(a) Time saved, women can take up income generating jobs (b) Additional jobs are created due to the project activity; business ventures will be promoted due for the construction of 18,000 biogas units
Way of monitoring	How	(a) Income generation activities taken up women after the project activity (b) Payments made for construction of biogas units from online monitoring database
	When	(a) Annual stratified sample survey (b) Extraction from online monitoring system which will be updated on daily basis
	By who	Bagepalli Coolie Sangha/CDM Consultant

- Avoidance of drudgery
-Convenience to the family
-Better social environment at home

No		6
Indicator		Livelihood of the poor
Mitigation measure		No mitigation measure required
Chosen parameter		Improvement in living conditions especially of women in the family
Current situation of parameter		(a) Drudgery for women in collection, processing and storage of fuelwood (b) Time and efforts in cooking on traditional cook stove
Estimation of baseline situation of parameter		(a) Time and effort on collecting fuelwood, cooking and cleaning (b) Long hours and efforts for cooking on traditional cookstove
Future target for parameter		(a) Reduction of time in collection, processing and storage of fuelwood for cooking and hot water bath (b) Reduced time for cooking (c) Better social environment at home due to reduced drudgery especially for women
Way of monitoring	How	(a),(b) and (c) Stratified sample survey
	When	Annual stratified sample survey
	By who	Bagepalli Coolie Sangha/CDM Consultant

No	7
Indicator	Access to affordable and clean energy services

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Mitigation measure		No mitigation measure required
Chosen parameter		No. of biogas units constructed and operating
Current situation of parameter		Traditional cookstove is used for cooking and hot water bath
Estimation of baseline situation of parameter		Use of traditional cookstove for cooking and hot water bath
Future target for parameter		Installation of biogas units under CDM project
Way of monitoring	How	Extraction from online monitoring system which will be updated on daily basis
	When	During preparation of GS monitoring report from online monitoring system which will be updated on daily basis
	By who	Bagepalli Coolie Sangha/CDM Consultant

No		8
Indicator		Human and institutional capacity
Mitigation measure		No mitigation measure required
Chosen parameter		Improvement in human and institutional capacity as perceived by the communities
Current situation of parameter		Women are spending most of their time in fuelwood collection and cooking, leaving very less time for other activities Children are getting late to school as food is not ready in time.
Estimation of baseline situation of parameter		Large part of the time is spend going to the forests and other lands for fuelwood collection, processing them and storing them for daily use in cooking and hot water bath. Cooking takes a lot of time, especially in the morning resulting in delay of preparing food in time for the children to attend school in time.
Future target for parameter		(a) Empowerment of women as they have more time now to take up other activities (b) Children can attend school in time (c) Skill development and institutional capacity of CS members in daily monitoring, organization and implementation of the BCS CDM project.
Way of monitoring	How	PRA technique
	When	Annually
	By who	Bagepalli Coolie Sangha/CDM Consultant

No	9
Indicator	Quantitative employment and income generation
Mitigation measure	No mitigation measure required
Chosen parameter	Income generation at family level due to the project activity, as perceived by the communities

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Current situation of parameter		Large part of the time is spend going to the forests and other lands for fuelwood collection, processing them and storing them for daily use in cooking and hot water bath. Cooking on traditional cookstove also takes a lot of time. takes a lot of time, leaving very less time for other activities.
Estimation of baseline situation of parameter		Time spend on procuring fuelwood and cooking. Time available for other activities.
Future target for parameter		(a) Income generation activities taken up by women (b) Income from CERs after the initial period of CERs revenue to the investor
Way of monitoring	How	Stratified sample survey
	When	Annual
	By who	Bagepalli Coolie Sangha/CDM Consultant

No		10
Indicator		Balance of payments and investment
Mitigation measure		No mitigation measure required
Chosen parameter		(a) Foreign revenue to the project (b) Money saved per family due to decrease in use of kerosene
Current situation of parameter		(a) No foreign investment for rural energy activities (b) Currently kerosene is purchased for cooking and hot water bath
Estimation of baseline situation of parameter		No 100% investment for family level energy programmes Kerosene is purchased for cooking and hot water bath
Future target for parameter		(a) Foreign revenue from sale of CERs for construction of biogas units (b) Replacement of kerosene by biogas
Way of monitoring	How	(a) Audited Account Statement for the project activity (b) Stratified sample survey
	When	(a) and (b) Annual
	By who	(a) Chartered Accountant (b) Bagepalli Coolie Sangha/CDM Consultant

Additional remarks monitoring

The stratified sample survey will be done on a statistically significant sample size. Questionnaires will be designed, field tested and implemented to collect information.

The samples will be tested at reputed laboratories.

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SECTION H. Additionality and conservativeness

This section is only applicable if the section on additionality and/or your choice of baseline does not follow Gold Standard guidance

H.1. Additionality

The additionality assessment of the project is based on the UNFCCC approved additionality tool "Tool for the demonstration and assessment of additionality". The project was registered as a CDM project in August 2009. Kindly view the additionality section B.5 of the registered Project Document Design.

H.2. Conservativeness

The emission reductions is real, measurable and verifiable as it is based on an approved baseline and monitoring methodology "Scope 1; TYPE I - RENEWABLE ENERGY PROJECTS, I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, version 01, EB 37". This is the latest version of the methodology.

The baseline calculations are conservative and transparent as can be seen from the PDD. The non-renewable biomass and fuelwood use for emission reduction calculation is conservative, which has also been validated by the DOE.

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ANNEX 1 ODA declaration