

### GEFM&E Terminal Evaluation Review Form

1. PROJECT DATA				
GEF ID: 370		Review date:		
IA ID: 464		<u>at endorsement</u> (Million US\$)		<u>at completion</u> (Million US\$)
Project Name: Development of high rate biomethanation processes as means of reducing greenhouse gas emissions		<b>GEF financing:</b>		5.50
Country: India		IA/EA own:		5.5
		Government:		4.5
		Other*:		5.5
		<b>Total Cofinancing</b>		4.5
Operational Program: 6		<b>Total Project Cost:</b>		10.00
IA: UNDP		<b>Dates</b>		
Partners involved: Ministry of Non conventional energy sources		Work Program date		05/01/1992
		CEO Endorsement		NA
		Effectiveness/ Prodoc Signature (i.e. date project began)		03/15/1994
		Closing Date	Proposed: 01/01/1999	Actual: Sept 2005
Prepared by: Neeraj Negi	Reviewed by: Aaron Zazueta	Duration between effectiveness date and original closing: 57 months	Duration between effectiveness date and actual closing: 138 months	Difference between original and actual closing: 81 months
Author of TE: Jan van den Akker Vinay Deodhar		TE completion date: December 2005	TE submission date to GEF OME: 2/9/2006	Difference between TE completion and submission date: 2 months

\* Other is referred to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

### 2. SUMMARY OF PROJECT RATINGS

GEFME Ratings for project impacts (if applicable), outcomes, project monitoring and evaluation, and quality of the terminal evaluation: Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U), Highly Unsatisfactory (HU), not applicable (N/A) and unable to assess (U/A). GEFME Ratings for the project sustainability: Highly likely (HL), likely (L), moderately likely (ML), moderately unlikely (MU), unlikely (U), highly unlikely (HU), not applicable (N/A), and unable to assess (U/A).

Please refer to document "Ratings for the achievement of objectives, sustainability of outcomes and impacts, quality of terminal evaluation reports and project M&E systems" for further definitions of the ratings.

	Last PIR	IA Terminal Evaluation	Other IA evaluations if applicable (e.g. OED)	GEFME
2.1 Project outcomes	S	NA	NA	S
2.2 Project sustainability	N/A	NA	NA	ML
2.3 Monitoring and evaluation	N/A	NA	NA	U
2.4 Quality of the evaluation report	N/A	N/A	NA	MS

Should this terminal evaluation report be considered a good practice? Why?

Certain issues, such as attainment of project outcomes, have been well addressed in the TE and could be

considered as good practice. However, some of the issues such as risks have not been well addressed. Hence, overall the report may not be a good practice.

### 3. PROJECT OBJECTIVES, EXPECTED AND ACTUAL OUTCOMES

#### 3.1 Project Objectives

- **What are the Global Environmental Objectives? Any changes during implementation?**

According to the TE the global environmental objective of the project was “reduction of methane emission by demonstrating and developing the capabilities in India to effectively capture methane-containing biogas from various sources of organic waste, such as pulp and paper, leather industry, slaughterhouses, vegetable waste, agro-processing waste and municipal sewage.”

Since the Project Appraisal Document submitted at for CEO Endorsement is not accessible, for comparison the PIR were relied on. The global environmental objective listed in the PIR 2000 is slightly different from that listed in the TE. According to the PIR the global environmental objective of the project was to “enable India to make its contributions in protecting the global and local environment by developing aggressive plans to recover methane from wastes in the municipal, industrial and agricultural sectors and gainfully utilizing the same.”

Thus, the two document list slightly different global environmental objectives. The TE acknowledges that there was change in project objectives without listing the reasons for it.

- **What are the Development Objectives? Any changes during implementation?**

According to the TE, the project had following four development Objectives:

- Developing a National Master Plan (NMP) for the generation and utilization of biogas based on high-rate bio-methanation processes
- Setting up 16 demonstration subprojects
- Capacity building of organizations at national and State level
- Promotion of dissemination of the idea of biomethanation technology and biogas utilization through national and local level seminars.

TE mentions that there have been changes in the performance parameters of the project – in terms of objectives and outputs. This is evident as a slightly different version of the development objectives is listed in PIR 2001. The development objectives listed in PIR 2001 are:

- To develop a National Master Plan for generation and utilization of bio-energy based on high rate biomethanation processes with the objective of reducing atmospheric emissions of methane, generation of energy/electricity and improve the quality of the environment.
- To develop commercially viable technology packages ready for replication.
- To promote and disseminate the idea of generation and utilization of biogas through high rate biomethanation processes using various substrates.

Thus the TE does not list the objective, “to develop commercially viable technology packages ready for replication” which has been listed by the PIR 2001. Further, it lists two additional objectives: “Setting up 16 demonstration subprojects” and “Capacity building of organizations at national and State level.” These changes have not been explained in the TE.

#### 3.2 Outcomes and Impacts

- **What were the major project outcomes and impacts described in the TE?**

While discussing the outcomes and impacts of the project, TE report lists only project outputs and inputs. This is probably because most of the outcomes and impacts were not measured due to the absence of an M&E system. According to the TE, following are the key accomplishments of the project:

- The project gave a major thrust to the National Program on Energy Recovery program, aimed at promotion, development demonstration dissemination and adoption of environment friendly conversion technologies for both liquid and solid wastes, being implemented by the Ministry of Non-conventional Energy Sources (MNES) since 1995. The National Master Plan (NMP) for Waste-to-Energy drafted as part of the project is being used by MNES in their policy formulation regarding waste management and methane gas recovery.
- Of the 16 subprojects, 2 studies have been carried out and out of the 14 technology demonstration

<p>projects, 13 have been completed (with 50% of the investment cost of project as support from MNES whereas 75% contribution was provided for projects based on vegetable market wastes and the balance coming from the beneficiaries).</p> <ul style="list-style-type: none"> <li>• Some 46 business meetings and workshops, and 9 national training programs were organized. Seventy one professionals were deputed in 12 fellowship training programmes and 15 study tours were organised for 43 officials of government institutions and organisations. The project has facilitated interaction between project developers (municipalities, industry), technology institutions, national laboratories and state nodal energy agencies; although the evaluation team noticed that this institutional interaction differed from subproject to subproject. A quarterly newsletter, "Bio-Energy News", is brought out under the aegis of this project.</li> <li>• The project has had positive environmental impacts. The estimated direct annual greenhouse gas emission reduction from the 13 demonstration subprojects is an estimated 244,000 tCO<sub>2e</sub> per year.</li> </ul> <p>Elsewhere, however, while describing the direct benefits of the project, the TE report lists per unit cost of replacing carbon dioxide emissions for each of the "sub projects." This could be considered as direct evidence of reduction/replacement of carbon emissions which could be considered as a major project impact.</p>
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#### 4. GEF OFFICE OF M&E ASSESSMENT

<b>4.1 Outcomes and impacts</b>	<b>Rating: S</b>
<b>A Relevance</b>	
<ul style="list-style-type: none"> <li>• <b>In retrospect, were the project's outcomes consistent with the focal areas/operational program strategies? Explain</b></li> </ul>	<b>Rating: S</b>
The project's outcomes are consistent with the focal areas/and operational program strategies (OP 6: Promoting the Adoption of Renewable Energy by Removing Barriers and Implementation Costs). It did address the issue of adoption of renewable energy technology by reducing barriers.	
<b>B Effectiveness</b>	
<ul style="list-style-type: none"> <li>• <b>Are the project outcomes as described in the TE commensurable with the expected outcomes (as described in the project document) and the problems the project was intended to address (i.e. original or modified project objectives)?</b></li> </ul>	<b>Rating: S</b>
The project could be considered effective in meeting the project objectives. While commenting on the quality of implementation the TE notes that project was implemented in a manner that most of the envisaged results have been achieved.	
<b>C Efficiency (cost-effectiveness)</b>	
<ul style="list-style-type: none"> <li>• <b>Include an assessment of outcomes and impacts in relation to inputs, costs, and implementation times based on the following questions: Was the project cost – effective? How does the cost-time Vs. outcomes compare to other similar projects? Was the project implementation delayed due to any bureaucratic, administrative or political problems?</b></li> </ul>	<b>Rating: S</b>
Although the project does not make a tentative judgment on the overall cost effectiveness of the project, the data in table 3 of the TE – which describes the daily biogas production and cost of obviating a metric ton of carbon dioxide for each of the "demo sub projects" – shows that the direct benefits of the project were quite substantial. Based on this and the information that the project was able to achieve most of its expected results, it could be inferred that the project was quite cost effective. According to TE, some of the sub-projects undertaken as part of the project were not as cost effective owing to a high proportion of imported equipments.	

**4.2 Likelihood of sustainability.** Using the following risk criteria, include an assessment of sustainability of project outcomes and impacts based on the information presented in the TE.

<b>A Financial resources</b>	<b>Rating: ML</b>
According to the TE, some of the sub-projects that were used for demonstration are commercially viable. Others may not be viable without capital cost subsidy. There are signs that the technologies promoted by the project are increasingly being adopted by the private sector organizations on their own. Increasing indigenization is also expected to reduce costs. These developments suggest that the financial risks that may threaten sustainability of the project activities are low.	
<b>B Socio political</b>	<b>Rating: L</b>
According to TE the central government has adopted policy measures that encourage biomethanation. Although the TE does not discuss the socio-political risks in detail, the narrative gives an impression that there is sufficient political support for the project and socio-political risks to outcomes of the projects are minimal.	
<b>C Institutional framework and governance</b>	<b>Rating: ML</b>
According to the TE, the MNES is using the National Master Plan (NMP) regarding waste management and	

methane gas recovery. Also many government departments have programs to promote bio-methanation. Overall the policy The institutional framework and governance related risks to project outcomes are low.
<b>D Environmental (for example, for coffee production projects, reforestation for carbon sequestration under OP12, etc.)</b> <span style="float: right;"><b>Rating: NA</b></span>
The TE does not discuss the environmental risks associated with the project.

**Sustainability Ratings: L**

- A. Financial: L**
- B. Socio-Political: L**
- C. Institutional Framework and Governance: ML**
- D. Ecological: NA**

**4.3 Assessment of the project's monitoring and evaluation system based on the information in the TE**

<b>A. In retrospection, was the M&amp;E plan at entry practicable and sufficient? (Sufficient and practical indicators were identified, timely baseline, targets were created, effective use of data collection, analysis systems including studies and reports, and practical organization and logistics in terms of what, who, when for the M&amp;E activities)</b> <b>Rating: U</b>
According to the TE, since the project was conceived in during the earlier stages of GEF, when there was little emphasis on M&E, it did not have an M&E plan at entry.
<b>B. Did the project M&amp;E system operate throughout the project? How was M&amp;E information used during the project? Did it allow for tracking of progress towards projects objectives?</b> <b>Rating: U</b>
According to the TE due to absence of an M&E plan, the actual system to monitor project performance was not well implemented.
<b>C. Was M&amp;E sufficiently budgeted and was there existing capacity or was this capacity built to implement the M&amp;E plan?</b> <span style="float: right;"><b>Rating:</b></span> <b>NA</b>
NA
<b>Can the project M&amp;E system be considered a good practice?</b> No.

**Catalytic Outcomes**

1. Production of Public good.

2 Demonstration.

The project demonstrated commercial viability of some of the bio-methanation and waste management technologies and provided assistance to the interested institutions in adopting the technology.

3 Replication.

Some of the private sector organizations have now started adopting the technologies promoted by the project. However, the TE does not ascertain the extent to which this trend is driven by the individual and unrelated actions of the private organizations or by the demonstration and outreach efforts of the project.

4 Scaling up.

Some of the policy measures suggested by the National Master Plan (NMP), which was drafted as part of the project, regarding waste management and methane gas recovery have been accepted and being used by the Ministry of Non-conventional Energy Sources (MNES) in its policies.

**4.4 Lessons**

Project lessons as described in the TE

<b>What lessons mentioned in the TE that can be considered a good practice or approaches to avoid and could have application for other GEF projects?</b>
According to the TE, the project provides following lessons: <ul style="list-style-type: none"> <li>• Large and complex technology projects need to be designed properly, based on a thorough review of the issues and options. The time-frame of the project needs to be realistic.</li> <li>• The PDF system is a good thing for large GEF projects. India Biomethanation project did not have this support; consequently the project planning was not of desirable standard and could have</li> </ul>

- affected project performance.
- A sound M&E system is essential. Since the project lacked a proper monitoring and evaluation system, it has been difficult to monitor the Project's impact.

**4.5 Quality of the evaluation report** Provide a number rating 1-6 to each criteria based on: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, and Highly Unsatisfactory = 1. Please refer to the "Criteria for the assessment of the quality of terminal evaluation reports" in the document "Ratings for the achievement of objectives, sustainability of outcomes and impacts, quality of terminal evaluation reports and project M&E systems" for further definitions of the ratings.

<b>4.5.1 Comments on the summary of project ratings and terminal evaluation findings</b>
In some cases the GEF Office of M&E may have independent information collected for example, through a field visit or independent evaluators working for the Office of M&E. If substantial independent information has been collected, then complete this section with any comments about the project.
No such information available to the reviewer.

<b>4.5.2 Quality of terminal evaluation report</b>	<b>Ratings</b>
Does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	S
Is the report internally consistent, is the evidence complete/convincing and are the IA ratings substantiated?	MS
Does the report properly assess project sustainability and /or a project exit strategy?	MU
Are the lessons learned supported by the evidence presented and are they comprehensive?	MU
Does the report include the actual project costs (total and per activity) and actual co-financing used?	MU
Does the report present an assessment of project M&E systems?	S

<b>4.6 Is a technical assessment of the project impacts described in the TE recommended?</b> Please place an "X" in the appropriate box and explain below.	<b>Yes:</b>	<b>No:</b> <b>X</b>
Explain: Projects impacts are well documented in the TE.		
Is there a follow up issue mentioned in the TE such as corruption, reallocation of GEF funds, etc.?		
No such issue has been identified in the TE.		

<b>4.7 Sources of information for the preparation of the TE review in addition to the TE (if any)</b>
PIR 2000, PIR 2001, PIR 2002, PIR 2003 & PIR 2005