United Nations Development Programme

Ministry of New and Renewable Energy, Government of India

Terminal Evaluation of UNDP/GEF Project: Scale Up of Access to Clean Energy for Rural Productive Uses (India ACE Project)

(GEF Project ID: 4900; UNDP PIMS ID: 4605)

Terminal Evaluation Report

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December 2020

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SYNOPSIS

Title of UNDP supported GEF financed project: Scale Up of Access to Clean Energy for Rural Productive Uses (India ACE Project)

UNDP Project ID: PIMS 4605

GEF Project ID: 4900

Evaluation time frame: 23 July 2015 to 23 July 2020

CEO endorsement date: 23 July 2015

Project implementation start date: 23 July 2015

Project end date: 23 July 2020

Date of evaluation report: 28 September 2020

Region and Countries included in the project: India

GEF Focal Area Objective: CCM-4 (for GEF-5): Promoting investment in renewable energy technologies

Implementing partner and other strategic partners: Implementing partner: Ministry of New and Renewable Energy (MNRE)

Evaluation team members: Mr. Roland Wong, International Consultant
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Acknowledgements:
The Evaluators wish to acknowledge with gratitude the time and effort expended by all project participants and stakeholders interviewed during the course of the Terminal Evaluation of the "India ACE Project". In particular, we wish to thank the UNDP India, UNDP Regional Hub in Bangkok, the Ministry of New and Renewable Energy, the state officials from the Assam Energy Development Agency and the Odisha Energy Development Agency, as well as other former Project managers and former Project personnel for making the efforts to recall details of their time while on the project.

EXECUTIVE SUMMARY

This report summarizes the findings of the Terminal Evaluation Mission conducted during the 25 August - 3 November 2020 period for the UNDP-GEF Project entitled: "*Scale Up of Access to Clean Energy for Rural Productive Uses*" (hereby referred to as the India ACE Project, ACE Project or the Project), that received a US$ 4,006,849 grant from the Global Environmental Facility (GEF) in July 2015.

Project Summary Table

Project Title:	*Scale Up of Access to Clean Energy for Rural Productive Uses (India ACE Project)*			
GEF Project ID:	4900		*at endorsement (Million US$)*	*at completion (Million US$)*
UNDP Project ID:	4605	GEF financing:	4.006	0.0
Country:	India	IA/EA own:	0.800	0.0
Region:	Asia and the Pacific	Government:	10.000	0.0
Focal Area:	Climate Change	Other:	8.234	0.0
FA Objectives, (OP/SP):	SP3 for GEF 4: Promoting market approaches for renewable energy	Total co-financing:	19.034	0.0
Executing Agency:	Ministry of New and Renewable Energy (MNRE)	Total Project Cost:	23.040	0.0
Other Partners involved:		ProDoc Signature (date project began):		23 July 2015
		(Operational) Closing Date:	Proposed: 23 July 2020	Actual: 23 July 2020

Project Description

India's rural population in 2019 was estimated to be 895 million people, or 65.5% of India's estimated population of 1.366 billion. While India's efforts to reduce poverty has resulted in positive trends since 1993, the Government of India (GoI) as of 2012 had intended to increase their efforts to provide more focus on its development efforts to eradicate rural poverty, and reduce the large income gap between urban and rural areas in India. This included MNRE programs to expand grid electricity and thermal energy to un-served and underserved areas (with improved cookstoves, solar cookers, and biogas stoves connected to biogas plants) resulting in mixed results. Many of these policies and programs were either discontinued or absorbed into other programs, leading to a lack of policy continuity in tackling rural energy access.

GoI identified 2 primary challenges in providing access to modern and affordable energy services to unserved and underserved regions of India:

- outreach to those communities who do not have access to energy; and
- taking actions to address climate change.

The ACE Project initially conceived in 2012 and designed in 2015 was to provide the GoI with pilot approaches for scaling-up deployment of renewable energy technology packages for rural livelihoods (RETPRLs) for enhancing rural livelihoods in un-served and underserved communities in 3 states (Assam, Odisha and Madhya Pradesh), demonstrate improved approaches for outreach to these communities, all of which would contribute to India's national goal of providing electricity access to 100% of households by 2019 and addressing climate change. The ACE Project planned pilot deployment of RETPRLs that would be in demand by these communities such as solar energy for irrigation pump sets, related to agricultural post-harvest processing (including cold storage, drying, pulp making) thereby reducing loss of perishable outputs, and related to fish storage and drying facilities to reduce wastage and increase income of fisherfolk. With RETPRLs piloted, the Project would avail subsequent resources for scaling-up through policy and regulatory support, and support to strengthen RE technology supply chain.

Project Results

The Project goal and objective and overall outcomes of the ACE Project are summarized on Table A against intended outcomes in the ACE Project Results Framework (PRF).

Table A: Comparison of Intended Project Outcomes from PRF of 2015 to Actual Outcomes

Intended outcomes in LFA of 2015	Outcomes as of July 2020
Project Goal: Reduced GHG emissions achieved through renewable energy systems in rural livelihood sectors	**Actual achievement of Project goal**: 348 tCO_{2eq} of GHG emissions reduced (against a target of 69,115 tCO_{2e}) through renewable energy systems in rural livelihood sectors.
Project Objective: Enhancing reliable and affordable clean energy access for rural livelihoods in un-served and underserved areas	**Actual achievement of Project objective:** Very limited reliable and affordable clean energy access enhancements for rural livelihoods (only solar cold storage) in un-served and underserved areas targeted under the ACE Project.
Outcome 1: Deployment of RE-rural livelihood application packages.	**Actual Outcome 1**: Deployment of only one RE-rural livelihood application package for demonstration (solar cold rooms), which is an insufficient number of RETPRLs to catalyse replication and a deployment to meet the target of 30,000 households adopting RETPRLs
Outcome 2: Increased supply of RE technology and service providers for rural livelihood applications.	**Actual Outcome 2:** Over 55 suppliers of RE technology and service providers for rural livelihood applications were identified but were never incubated for preparation of business plans or financed through financial mechanisms for the supply and installation of RETPRLs.
Outcome 3.1: Inclusion of RE applications in national and state level rural livelihoods policies for key livelihood sectors in rural areas	**Actual Outcome 3.1:** No RE applications in national and state level rural livelihoods policies for key livelihood sectors in rural areas.
Outcome 3.2: Future MNRE programs also cater to actions towards enhanced RE utilisation in rural livelihoods	**Actual Outcome 3.2**: There is a draft MNRE framework proposed to promote decentralized renewable energy (DRE) systems for livelihood generation in rural India that acknowledges ongoing innovators and entrepreneurs (outside of ACE) who have come up with a variety of RETPRLs which have demonstrated energy efficiency and economic viability in rural settings.
Outcome 3.3: Improved tariff and grid interconnection regulations for decentralised RE	**Actual Outcome 3.3:** No improvement of tariff and grid interconnection regulations for decentralised RE resulting from ACE activities.
Outcome 4.1: Improved decentralised RE subsidies and support for rural livelihoods.	**Actual Outcome 4.1**: There are no improved decentralised RE subsidies and support for rural livelihoods resulting from ACE activities.

Intended outcomes in LFA of 2015	Outcomes as of July 2020
Outcome 4.2: Enhanced provision of financial support for decentralised RE in rural livelihood applications.	**Actual Outcome 4.2:** There is no enhanced provision of financial support for decentralised RE in rural livelihood applications.
Outcome 4.3: Improved investment risk mitigation for decentralised RE in rural livelihood applications	**Actual Outcome 4.3:** There are no improvements in investment risk mitigation for decentralised RE in rural livelihood applications that resulted from ACE activities.

Summary of Conclusions, Recommendations and Lessons

The ACE Project's primary thrust of utilizing GEF resources was to facilitate stronger and innovative linkages with rural communities to bring them "renewable energy for livelihoods" (especially those of the majority of farmers, who are marginal land holders with less than 1 ha of land). Notwithstanding early enthusiasm for the ACE Project that was jointly designed by MNRE, UNDP and various other partners (including NGOs, CSR foundations and academic institutions), the ACE Project failed to achieve its intended goal and objective primarily due to its failure to deliver Outcome 1, most importantly, Output 1.2 or the deployment of demonstration RETPRLs. With Output 1.2 being so crucial towards achievement of the replications (Output 1.4) and other intended outcomes, much of the focus of this Evaluation was shifted to the numerous management issues encountered during the first 4 years of implementing the ACE Project (as detailed in Paras 49 to 51). The most important of these issues amongst others included:

- the Project Management Unit (PMU) never having been fully-staffed according to the ProDoc to manage complex institutional arrangements and strengthening linkages between a central government agency, MNRE with SNAs, local governments and rural communities (Para 51);
- MNRE's lack of clarity in working with CLIAs (NGOs) that resulted in an MNRE subsidy scheme (launched in August 2018) on which SNAs (not CLIAs) would prepare RETPRL proposals that would be linked to a 30% subsidy using ACE resources (Para 49, 4th bullet)
- Poor response by SNAs for proposals linked to the August 2018 MNRE subsidy scheme due to a SNAs wanting a 70-80% subsidy (which was not feasible for the RETPRLs under consideration), and the resulting reluctance of MNRE to change its 30% subsidy policy to a more competitive scheme against other CSR foundation schemes that offer subsidies where a beneficiary pays less than 10%. CSRs were able to offer better schemes due to falling solar PV prices in India from 2016 to 2018 resulting in several solar-related RETPRLs becoming more available and affordable to villagers (Para 50);
- the lack of MNRE-PMU personnel after mid-2018 to manage the ACE Project, leaving UNDP to manage the ACE project after 2018;
- deployment of 6 solar cold rooms as the first RETPRL deployment of the ACE Project driven by UNDP in early 2019, Year 4 of a 5-year project (Para 78). By the time the solar cold rooms were operational, the ACE Project had insufficient resources and personnel to monitor the performance of these cold rooms and the benefits generated to the communities;
- MNRE not holding one PSC meeting during the duration of the ACE Project to share progress issues and solicit inputs from key ACE stakeholders (Para 49, last bullet).

Management issues (detailed in Para 112) demonstrates an overall failure of MNRE to consider an alternative course for delivering demonstration RETPRLs in a timely manner after the MNRE decision for the Project to pivot away from CLIAs. These management issues and delays by MNRE resulted in the first RETPRL deployment in the field by Year 4 of a 5-year project that also brought ACE into a period where there were changes to RETPRL market conditions. This included substantial reductions in the price of solar

PV technologies in India (in some cases up to 50% reduction of the 2019 prices from those of 2014 making solar PV more accessible and less innovative in terms of deployment), and the electrification of several rural communities (reducing demand and relevance of certain RE power generation technologies in certain places such as solar PV lighting or solar PV pumping possibly in another 5 years depending on the quality of electrification).

Notwithstanding the improvements in rural electrification in the 3 pilot states, the proposed draft policy framework of October 2020 (as described in Para 90) to promote decentralized renewable energy (DRE) for rural livelihoods still demonstrates that this sector of RE development is high on MNRE's agenda, especially in the provision of energy access to all. This draft framework also recognizes the need for a different approach for RETPRLs from the approach taken in ACE, with the draft framework mentioning deployed RETPRLs by CSR foundations and other low carbon innovators throughout India demonstrating substantial benefits to household incomes and livelihoods

Corrective actions for the design, implementation, monitoring and evaluation of the project:

Action 1 (to MNRE and UNDP): To improve design of the ACE Project or similar projects that have central-state government interactions, project preparations should include more resources for project designers to include more details of the administrative actions to start the project, notably how MNRE communicates with the SNAs and delegates tasks to them. Project preparations of these types of projects may want to consider additional tasks (instead of forming them at the Inception phase). See Para 114 for these additional tasks.

Actions to follow up or reinforce initial benefits from the project*:*

Action 2 (to MNRE): Seek resources and partners to undertake RETRPL deployment through different implementation modalities. This expounds on the October 2020 draft MNRE framework mentioned in Para 90 for decentralized renewable energy (DRE) for rural livelihoods that acknowledges several agencies (CSR Foundations and NGOs) have conducted several successful RETPRL pilots and business models in livelihoods such as agriculture, agro-processing, dairy, fisheries and charkas, all of which are poised for replication for the growth of DRE. See Para 115 for additional details.

Action 3 (to MNRE): Create a semi-autonomous entity under MNRE to undertake CSR projects that are funded from CSR taxation of corporations. See Para 116 for further details.

Proposals for future directions underlining main objectives of ACE Project:

Action 4 (to UNDP): Assist MNRE in preparing strategic plan in support of their draft policy framework to promote DRE and RETPRLs that acknowledges the changing market conditions for RETRPLs in rural communities (related to decreasing solar PV prices and increased rural electrification) and what livelihoods can be enhanced through renewable energy. See Para 117 for further details.

Action 5 (to Government of India and UNDP): Strengthen future management and implementation of UNDP-GEF projects under NIM. See Para 118 for further details.

Best and worst practices in addressing issues relating to relevance, performance and success:

Practice requiring improvements: The project management units should never be understaffed. The understaffing of the ACE Project has led to disastrous consequences in terms of its achievements. See Para 119 for further details.

Practice requiring improvements: Project preparations teams for GEF projects need to provide more details to project implementation arrangements and designs that can reduce the adaptive management required by implementation teams and reduce unnecessary project delays. See Para 120 for further details.

Evaluation Ratings[1]

1. Monitoring and Evaluation	*Rating*	2. IA & EA Execution	*Rating*
M&E design at entry	3	Quality of Implementation Agency - UNDP	4
M&E Plan Implementation	2	Quality of Execution - Executing Entity (MNRE)	2
Overall quality of M&E	2	Overall quality of Implementation / Execution	3
3. Assessment of Outcomes	**Rating**	**4. Sustainability[2]**	**Rating**
Relevance[3]	2	Financial resources	1
Effectiveness	2	Socio-political	1
Efficiency	2	Institutional framework and governance	1
Overall Project Outcome Rating	1	Environmental	4
		Overall likelihood of sustainability	1

[1] Evaluation rating indices (except sustainability – see Footnote 2, and relevance – see Footnote 3): 6=*Highly Satisfactory (HS)*: The project has no shortcomings in the achievement of its objectives; 5=*Satisfactory (S)*: The project has minor shortcomings in the achievement of its objectives; 4=*Moderately Satisfactory (MS)*: The project has moderate shortcomings in the achievement of its objectives; 3=*Moderately Unsatisfactory (MU):* The project has significant shortcomings in the achievement of its objectives; 2=*Unsatisfactory (U)* The project has major shortcomings in the achievement of its objectives; 1=*Highly Unsatisfactory (HU):* The project has severe shortcomings in the achievement of its objectives.

[2] Sustainability Dimension Indices: *4 = Likely (L):* negligible risks to sustainability; *3 = Moderately Likely (ML):* moderate risks to sustainability; *2 = Moderately Unlikely (MU):* significant risks to sustainability; and *1 = Unlikely (U):* severe risks to sustainability. *Overall rating is equivalent to the lowest sustainability ranking score of the 4 dimensions.*

[3] Relevance is evaluated as follows: 2 = Relevant (R); 1 = Not relevant (NR)

ABBREVIATIONS

Acronym	Meaning
ACE	UNDP-GEF Project: "Scale Up of Access to Clean Energy for Rural Productive Uses" or (India ACE Project)
APR-PIR	Annual Project Report - Project Implementation Report
AEDA	Assam Energy Development Agency
AV	Audio-visual
AWP	Annual Work Plan
BAU	Business-as-usual
BEE	Bureau of Energy Efficiency
BIS	Bureau of Indian Standards
BRH	Bangkok Regional Hub
CBO	Community-based organization
CCM	Climate Change Mitigation
CEEW	Council on Energ, Environment and Water
CLIA	Cluster-level implementing agency (mainly NGOs)
CO	UNDP Country Office
CO_2	Carbon Dioxide
CP	Country Programme
CPAP	Country Programme Action Plan
CPD	Country Programme Document
CSR	Corporate social responsibility
CSU	Cluster Support Units
DDG	Decentralized Distributed Generation
DDUGJY	Deendayal Upadhyaya Gram Jyoti Yojana
DEA	Department of Economic Affairs
DRE	Decentralized renewable energy
EDA	Energy Development Agency
EE	Energy Efficiency
EoI	Expression of Interest
EoP	End-of-Project
FY	Fiscal Year
FYP	Five-Year Plan
GEF	Global Environment Facility
GoI	Government of India
GHG	Green House gas
IEP	Integrated Energy Policy of 2006
INDC	Intended Nationally Determined Contributions
INR	Indian Rupee
IREDA	Indian Renewable Energy Development Agency
JNNSM	Jawaharlal Nehru National Solar Mission
KVIC	Khadi and Village Industries Commission
kWh	kilowatt hour
LPG	Liquid petroleum gas
M&E	Monitoring and evaluation
MoEFCC	Ministry of Environment and Forests and Climate Change
MNRE	Ministry of New and Renewable Energy (formerly Ministry of Non-Conventional Sources or MNES)
MoP	Ministry of Power

Acronym	Meaning
MoRD	Ministry of Rural Development
Mtoe	Million tonnes of oil equivalent
MTR	Midterm Review
MW	Megawatt
NAPCC	National Action Plan on Climate Change
NABARD	National Bank for Agriculture And Rural Development
NGO	Non-government organization
NPD	National Project Director
NPM	National Project Manager
NRLM	National Rural Livelihood Mission (
NTPC	National Thermal Power Corporation
O&M	Operation and Maintenance
OFP	Official Focal Point for GEF in India
OP	Operational Programme of GEF
OREDA	Odisha Renewable Energy Development Agency
PEC	Project Executive Committee
PIMS	UNDP/GEF Project Information Management System
PIR	Project Implementation Report
PM	Project Manager
PMU	Project Management Unit
PPG	Project preparation grant
PRF	Project Results Framework
PSC	Project Steering Committee
PV	Photovoltaic
RE	Renewable energy
RET	Renewable energy technology
RETPRL	Renewable energy technology packages for rural livelihoods
RFP	Request for proposal
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
SCC	State Coordination Cell
SE4ALL	Sustainable Energy for All
SLM	State Livelihood Missions
SMART	Specific, Measurable, Attainable, Relevant and Time-bound
SNA	State Nodal Agency
SNC	India's Second National Communication Report
SOP	Standard Operating Procedures
SRM	State regulatory commission
tCO2	Tonne of Carbon Dioxide
TE	Terminal Evaluation
ToC	Theory of Change
ToR	Terms of Reference
TRAC	Target for Resource Assessment from the Core (UNDP TRAC funds)
UN	United Nations
UNDAF	UN Development Assistance Framework
UNFCCC	UN Framework Convention on Climate Change
UNDP	UN Development Programme
UNIDO	United Nations Industrial Development Organization
USD	United States dollar (~66 Indian Rupee per US$)

1. INTRODUCTION

1. This report summarizes the findings of the Terminal Evaluation Mission conducted during the period of August and November 2020 for the UNDP-supported GEF-financed Project entitled: "Scale Up of Access to Clean Energy for Rural Productive Uses" (hereby referred to as the India ACE Project, ACE Project or the Project) that received a US$ 4,006,849 grant from the Global Environmental Facility (GEF).

2. The goal of the India ACE Project was to "reduce GHG emissions achieved through renewable energy systems in rural livelihood sectors", and the objective was to "enhance reliable and affordable clean energy access for rural livelihoods in unserved and underserved areas".

1.1 Purpose of the Evaluation

3. In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP supported GEF-financed projects are required to undergo a Terminal Evaluation (TE) upon completion of implementation of a project to *provide a comprehensive and systematic account of the performance of the completed project by evaluating its design, process of implementation and achievements vis-à-vis GEF project objectives and any agreed changes during project implementation.* As such, the TE for the India ACE Project serves to:

   - promote accountability and transparency, and to assess and disclose levels of accomplishments of the Project in the context of providing technical assistance and demonstration towards increasing access to clean energy for rural livelihoods, catalysing business investments into supplying renewable energy (RE) to rural livelihoods, streamlining regulatory support for RE in its applications for rural livelihoods, and catalysing financial support for the intended scale-up of these RE applications for rural livelihoods;
   - synthesize lessons that may help improve the selection, design and implementation of future GEF activities;
   - provide feedback on issues that are recurrent across the renewable energy portfolio that require attention, and on lessons to be learned for possible follow-up efforts on how to support RE applications in a challenging market where subsidies may be necessary to generate interest in scaling up RE investment; and
   - contribute to the GEF Evaluation Office databases for aggregation, analysis and reporting on effectiveness of GEF operations in achieving global environmental benefits and on the quality of monitoring and evaluation across the GEF system.

4. This TE was prepared to:

   - be undertaken independent of Project management to ensure independent quality assurance;
   - apply UNDP-GEF norms and standards for evaluations;
   - assess achievements of outputs and outcomes, likelihood of the sustainability of outcomes, and if the Project met the minimum M&E requirements; and
   - report basic data of the evaluation and the Project, as well as provide lessons from the Project on broader applicability. This would include an outlook and guidance in charting future directions by UNDP and the Government of India, on continued support for the increased use of renewable

energy technologies (RETs) and reducing GHG emissions from various rural livelihood sectors throughout India.

1.2 Scope and Methodology

5. The scope of the TE for the ACE Project was to include all activities funded by GEF and activities from parallel-financing. The Terms of Reference (ToRs) for the TE are contained in Appendix A. In consideration of the significant progress shortcomings of the Project, key issues that are being addressed on this TE include:

- design of the ACE Project and its effectiveness in achieving its stated objective of "enhance reliable and affordable clean energy access for rural livelihoods in unserved and underserved areas" and its goal of "reduce GHG emissions achieved through renewable energy systems in rural livelihood sectors" as articulated in Para 2;
- the possibility that there were administrative complexities that slowed the pace of implementation within a NIM Project that needed to be compliant with both MNRE and UNDP-GEF administrative procedures as well as the added coordination activities of the PMU with SNA-level staff in Odisha, Madhya Pradesh and Assam;
- the underestimation of efforts required to effectively deploy renewable energy technology package for rural livelihoods (RETPRLs) in rural communities and related to livelihood sectors4. The difficulties in the effective deployment of RETPRLs were likely compounded by time delays (with RETPRLs identified in 2014 for the ProDoc, and actual recommendations for deployment and ACE support by early 2016). This may have resulted in the stakeholders no longer being interested in the RETs identified due to changing market conditions for RETs in 2016 or these RETPRLs were being supported by other projects that taking away the opportunity of scaling-up targeted livelihood sectors under ACE;
- recommendations, lessons learned, and best practices generated by the ACE Project that could be used to improve implementation on other similar GEF projects.

6. The methodology adopted for this evaluation includes:

- Review of project documentation (i.e. APR/PIRs, meeting minutes of Project Steering Committee or multipartite meetings) and pertinent background information;
- Interviews with key project personnel including the current and former Project Managers, technical advisors, and Project developers; and
- Interviews with relevant stakeholders including other government agencies and institutes.

A detailed "itinerary" of this TE Mission (where no travel was made to India) is provided in Appendix B. A full list of people interviewed and documents reviewed are given in Appendix C and Appendix D respectively. The TE Mission Team for the UNDP-GEF project was comprised of one international expert, and one national expert.

7. The Project was evaluated for overall results in the context of:

[4] RETPRLs was a term coined by the designers of the India ACE Project to refer to a technology application of RE that can be used in a livelihood sector to support production and thus raise income.

- *Relevance* - The extent to which the outcome is suited to local and national development priorities and organizational policies, including changes over time;
- *Effectiveness* - The extent to which an objective was achieved or how likely it is to be achieved;
- *Efficiency* - The extent to which results were delivered with the least costly resources possible; and
- *Sustainability* - The likely ability of an intervention to continue to deliver benefits for an extended period of time after completion.

8. Since the MTR had only taken place 15 months earlier and with severe global travel restrictions in place due to the COVID-19 pandemic, this Evaluation mainly relied on field information from the MTR which was still deemed relevant to this TE, supplemented by information from selected interviewees on ACE activities since the 2019 MTR. With little to no physical progress achieved, no field visits to Project sites were made on this Evaluation. As a result, a limitation of this TE would be the inability of the TE team to visit field sites of the RE installations and to interview all key stakeholders in person. Notwithstanding, the TE team has made every effort to understand the Project and present a fair and a well-balanced assessment of the Project. Any gross misrepresentation of the Project has been resolved through discussions with the Project team.

1.3 Structure of the Evaluation Report

9. This TE report is presented as follows:

- An overview of Project activities from commencement of operations in 2014 with the Project Preparation Grant (PPG) phase to the end-of-project (EOP) in July 2020;
- An assessment of Project results based on Project objectives and outcomes through relevance, effectiveness and efficiency criteria;
- Assessment of sustainability of Project outcomes;
- Assessment of monitoring and evaluation systems;
- Assessment of progress that affected Project outcomes and sustainability; and
- Lessons learned and recommendations.

10. This evaluation report is designed to meet GEF's "Guidelines for GEF Agencies in Conducting Terminal Evaluations, Evaluation Document No. 3" of 2008:
http://www.thegef.org/gef/sites/thegef.org/files/documents/Policies-TEguidelines7-31.pdf

11. The Evaluation also meets conditions set by:

- the UNDP Document entitled "UNDP GEF – Terminal Evaluation Guideline":
http://web.undp.org/evaluation/documents/guidance/GEF/UNDP-GEF-TE-Guide.pdf;
- the UNDP Document entitled "Handbook on Planning, Monitoring and Evaluating for Development Results", 2009:
http://www.undp.org/evaluation/handbook/documents/english/pme-handbook.pdf; and
- the "Addendum June 2011 Evaluation":
http://www.undp.org/evaluation/documents/HandBook/addendum/Evaluation-Addendum-June-2011.pdf.

2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

12. India's rural population as of 2019 was estimated to be in the order of 895 million people, or 65.5% of India's estimated population of 1.366 billion[5]. The latest information on rural Indian poverty indicates estimates of 25.7% in 2011-12, a decrease from 50.1% in 1993-94[6] (urban rates of poverty are lower at 13.1% in 2011-12, a decrease from 38.1% in 1993-94). While India's efforts to reduce India's poverty has resulted in positive trends since 1993, the Government of India (GoI) as of 2012 had intended to increase their efforts to provide more focus on its development efforts in the eradication of rural poverty, and reducing the large income gap between urban and rural areas in India. As of 2012, the GoI had programs to expand grid electricity and thermal energy, predominately cooking energy needs to un-served and underserved areas. This included several initiatives of MNRE to provide modern cooking devices (improved cookstoves, solar cookers, and biogas stoves connected to biogas plants) resulting in mixed results. Many of these policies and programs were either discontinued or absorbed into other programs, leading to a lack of policy continuity in tackling rural energy access.

13. In 2012, when the ACE Project was initially conceived, the GoI identified 2 primary challenges in providing access to modern and affordable energy services to unserved and underserved regions of India:

- outreach to those communities who do not have access to energy; and
- taking actions to address climate change.

14. A number of policies, programmes and strategies were in place to drive implementation of the ACE Project including the Electricity Act of 2003, India's 12th Five-Year Plan (FYP), India's Second National Communication Report (SNC) to UNFCCC in May 2012[7], the Integrated Energy Policy 2006 (IEP), and GoI's programme for Decentralized Distributed Generation (DDG). These are all covered in some detail in Para 103.

15. More importantly, ACE in 2015 served as a unique project by which the GoI could pilot approaches for scaling-up deployment of renewable energy technology packages for rural livelihoods (RETPRLs) for enhancing rural livelihoods in un-served and underserved communities, demonstrate possible improved approaches for outreach to these communities, and contribute to India's national goal of providing electricity access to 100% of households by 2019[8]. Based on consultations with potential beneficiary communities during the PPG phase, the ACE Project was also planning to deploy RETPRLs that would be in demand by these communities such as solar energy for irrigation pump sets[9], related to agricultural post-harvest processing (including cold storage, drying, pulp making) thereby reducing loss of perishable outputs, and related to fish storage and drying facilities to reduce wastage and increase income of fisherfolk.

[5] https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=IN
[6] http://mospi.nic.in/sites/default/files/publication_reports/India_in_figures-2018_rev.pdf
[7] http://unfccc.int/resource/docs/natc/indnc2.pdf
[8] https://economictimes.indiatimes.com/industry/energy/power/india-can-achieve-1-65-billion-units-of-electricity-next-year-piyush-goyal/articleshow/53103685.cms
[9] Taking into account the March 2014 MNRE announcement of a programme to launch 17,500 solar PV based pumping systems in a number of states.

2.1 Project Start and Duration

16. The ACE Project concept was first submitted to the GEF in March 2012 and design work took place in 2014. The ACE Project was commenced on 23 July 2015 and had an end-of-project (EOP) date of 23 July 2020 (which was the intended EOP date in the ProDoc). The stated objective of the ACE Project was to "enhance reliable and affordable clean energy access for rural livelihoods in un-served and underserved areas." GEF funding allocated for the ACE Project was US$ 4,006,849 with committed co-financing at US$ 19,033,767.

17. During the period over which the ACE Project was implemented, India as well as the world had experienced phenomenal economic growth as well as significant changes and major reforms in the energy sector with more focus in India on solar-related technologies for energy generation. During the ACE Project, India also experienced falling global prices of solar PV equipment around 2015 and 2016, thus improving access of renewable energy to underserved communities.

2.2 Problems that the India ACE Project Sought to Address

18. The ACE ProDoc was prepared based on the barriers identified in 2014. The Project serves to augment GoI efforts in partnership with UNDP to lower barriers to expanding and scaling up energy access in rural areas and strengthen livelihoods. Notwithstanding ongoing MNRE programmes to support "Grid Connected Power", "Decentralised Systems" and "Off-Grid Power", the ACE Project sought in 2015 to enhance reliable and affordable clean energy to villages which are nominally connected to the electricity grid, but in practical terms are unserved or underserved, constraining their abilities to generate income from rural livelihoods. Key RE and rural livelihoods barriers that the ACE Project sought to address at its 2015 commencement included:

- poor understanding of key RE and rural livelihoods applications including a lack of suitable technical specifications and compliance mechanisms for meeting specifications;
- key RETPRLs have not been systematically demonstrated replicated, scaled up or documented;
- lack of integrated support for uptake of key RETPRLs is not effectively supported in an integrated fashion at the central, state and district levels;
- lack of awareness and institutional capacity for managing scale-up of key RETPRLs;
- RET suppliers and service providers are not well coordinated in utilizing the many central and state level funding programmes;
- lack of suitable and active RETPRL technology and service providers;
- national and state level rural livelihood mission statements and documents do not emphasise the critical role of RE in meeting unserved and underserved rural livelihoods energy needs;
- no formal and focused MNRE funding and support programme specifically focused on RETPRLs;
- decentralised RE applications focused on rural livelihoods face significant problems in setting suitable cost recovery tariffs in stand-alone applications, and in grid interconnection applications the financial and technical interconnection issues are generally unclear and problematic for RE entrepreneurs to access;
- inappropriate valuation of RE in rural livelihood applications within GoI's programmes for subsidy and other financial support, leading to difficulties for stakeholders to access this assistance. This includes favouring RE systems with the lowest initial cost and not the RE systems that meet the best technical specifications, and a general overestimation of investment risks.

Lowering of these barriers serves as the basis for the 5-year ACE Project design where RETPRL investments would be catalysed and positioned for scale-up by the End of Project (EOP).

2.3 Goal and Objective of the India ACE Project

19. The Project goal as taken from the 2015 ProDoc was to "reduce GHG emissions achieved through renewable energy systems in rural livelihood sectors". The objective of the ACE Project was to "enhance reliable and affordable clean energy access for rural livelihoods in unserved and underserved areas". The ACE Project PRF from 2015 is contained in Appendix F.

2.4 Baseline Indicators Established

20. The baseline indicators and their values for the ACE Project can be found in the PRF contained in Appendix F.

2.5 Main Stakeholders

21. The main stakeholder of the ACE Project is the Ministry of New and Renewable Energy (MNRE). While there were several stakeholders associated with the India ACE Project, Project funds involving these stakeholders were primarily channeled through MNRE. An elaboration of stakeholders who have participated or received support from the ACE Project is provided in Section 3.2.2 (Paras 53-56).

2.6 Expected Results

22. To achieve the specific objective of "enhancing reliable and affordable clean energy access for rural livelihoods in unserved and underserved areas", the ACE Project (as of 2015) was designed for the removal of barriers mentioned in Para 18 with the following expected Project outcomes:

- **Outcome 1**: Deployment of RE-rural livelihood application package;
- **Outcome 2:** Increased supply of RE technology and service providers for rural livelihood applications;
- **Outcome 3.1:** Inclusion of RE applications in national and state level rural livelihoods policies for key livelihood sectors in rural areas;
- **Outcome 3.2:** Future MNRE programs also cater to actions towards enhanced RE utilization in rural livelihoods;
- **Outcome 3.3:** Improved tariff and grid interconnection regulations for decentralized RE;
- **Outcome 4.1:** Improved decentralised RE subsidies and support for rural livelihoods;
- **Outcome 4.2:** Enhanced provision of financial support for decentralised RE in rural livelihood applications;
- **Outcome 4.3:** Improved investment risk mitigation for decentralised RE in rural livelihood applications.

These outcomes are also listed in the PRF of the India ACE Project that is contained in Appendix F.

3. FINDINGS

3.1 Project Design and Formulation

23. In consideration that a consistent and adequate supply of electricity is a prerequisite to implement and sustain most livelihood activities in rural India, its deficiency and often intermittent supply poses multiple challenges, creating a need for alternative sources of energy in villages. The overall design of the India ACE Project which took place during the PPG phase from February to November 2014, was conducted under the guidance of UNDP and MNRE and a PPG team consisting of an international and national consultant. A key activity of the PPG team was the consultations with more than 400 stakeholders in 3 states[10] to identify rural livelihoods and clean energy technology needs. Preparations to identify the stakeholders for consultations were based on desk research and informal interactions with identified stakeholders. The design process included study of the application of RETPRLs within 19 targeted communities (also referred to as clusters)[11]. This study resulted in 6 rural livelihood sectors being considered including poultry, dairy, horticulture, biomass-fuel related businesses (mainly informal), fisheries, and village-based textile (khadi) industries, all of which had potential for benefitting from off-grid clean energy.

24. RETs that were considered as having a significant impact on these sectors included solar power packs, solar pumps, solar cabinet dryers, solar aerators, solar charkha/loom, solar milk chillers, solar cold rooms, and biogas power plants. Given the time between the design of ACE (2014), the signature of the ACE ProDoc (23 July 2015) and the ACE Inception Workshop (13 July 2016), there was an expectation that identified clean energy technologies from 2014 would have evolved in mid-2016, necessitating the re-examination of RETPRLs after the Inception Phase of ACE. As well, the revalidation and possible expansion of the identified livelihood sectors in the targeted clusters was also deemed a necessity.

25. Much of the planned RETPRL deployment was assumed to supplement the GoI's baseline project of Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) that supports the extension of electricity supply to all households in India. RGGVY was replaced in 2015 by the Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) that includes extensive rural electrification work aiming for 100% village electrification as of May 2018[12]. Notwithstanding the recent improvements to rural electrification for all states (with some achieving 100% village electrification under some central and state schemes during the period of 2016-2019), the states under ACE, namely Assam, Madhya Pradesh and Odisha, were still under the national average for percentage of households using electricity as their primary sources for lighting, an indication that power supply in those provinces was still unreliable[13]. With frequent power cuts and associated voltage and frequency fluctuations, the erratic power supply in these states does significantly impact the productive capacity of potential ACE beneficiaries at the farmer and cluster levels. As such, they are unable to carry out tasks that require lighting loads such as weaving and dairy storage activities; this leads to increased spoilage of outputs such as dairy products that requires constant chilling. Moreover, state efforts to improve electricity supplies likely

[10] Odisha, Madhya Pradesh and Assam

[11] This process was aided by the Ashden India Renewable Energy Collective and Greentech Knowledge Solutions Private Limited who compiled a compendium of Renewable Energy Technology Packages for Selected Rural Livelihood Sectors (or RETPRLs) in June 2014, as a means of assisting the PPG Team in what RETs to present to the communities for improving their livelihoods.

[12] According to the MoP, Saubhagya Portal 2018. According to the MoP, Office Memorandum- Saubhagya 2017, the DDUGJY also includes the Pradhan Mantri Sahaj Bijli Har Ghar Yojana (Saubhagya), which aims to achieve universal household electrification by December 2018.

[13] Census of India 2001 and Census of India 2011

would have focused more on domestic and lighting loads, leaving less scope to improve electricity supplies for commercial and livelihood activities at large, and generating more demand for RE products.

26. The aforementioned scenario generates an increasing demand for alternate sources of electricity in the clusters. For example, many farming communities have diesel or kerosene pumps which are costly to purchase as well as operate for marginal farmers. Due to these costs, many of these communities are not positioned to meet their irrigation requirements for vegetable cultivation. Another example includes the increased reliance on firewood for cooking and heating since the cost and reliable delivery of Liquefied Petroleum Gas or LPG (through the distribution of LPG cylinders) is difficult to remote villages located in difficult terrains. While increased dependency on firewood for cooking and lighting purposes is not sustainable, it also constrains inhabitants of villages to improve their livelihoods. For example, a farmer with dairy products will have no opportunities for pasteurizing the milk. As such, deploying RETs to pilot alternatives to improve the reliability of electricity supply and heating becomes increasingly important. The consultations with rural communities during the PPG exposed a demand in clusters for solar-based systems, biomass gasifiers, biogas and wind plants, all using abundantly available renewable sunlight, biomass, and wind that the ACE Project seeks to address.

3.1.1 Analysis of Project Planning Matrix

27. The Evaluation Team has the following comments on the original PRF that was prepared in 2014 on its quality in comparison to best practices for preparing PRFs:

- The PRF has 7 outcomes for which 7 separate budgets were setup in the ProDoc. Common practice of most GEF projects is to have 4 to 5 outcomes for budgeting and monitoring purposes. Many of the ACE Project outcomes can be combined to reduce efforts for budgeting and monitoring by the Project's PMU. For example, Component 3 could be consolidated into one outcome that could read "improved policy and regulatory support that results in the inclusion of RE applications in national and state level rural livelihoods policies for key livelihood sectors in rural areas, future MNRE programs also cater to actions towards enhanced RE utilisation in rural livelihood, and improved tariff and grid interconnection regulations for decentralised RE";
- The layout of the matrix is clear and the wording of the indicators generally meets SMART criteria with clear targets. However, the number of indicators in this PRF can be reduced mainly to economize monitoring and reporting actions of the PMU. For example, for Component 1, the number of output indicators can be reduced from 7 indicators to 4 or 5 indicators for 4 outputs. In addition, the Outcome 1 indicator should not be repeated in Output 1.4 but be an indicator that is unique to reflect a desired outcome such as "deployment of RETPRLs in 50 clusters" as a means of indicating widespread geographic adoption of RETPRLs (which 30,000 households does not accomplish);
- This Evaluator is also of the opinion that any PRF does not need any outcome indicators. Delivery of the outputs should logically lead to the intended outcome. Examination of the ACE PRF outcome indicators reveals they are frequently repeated as output indicators, causing unnecessary monitoring and reporting actions for the PMU;
- No Theory of Change (ToC) was prepared for the ACE Project. At the time ACE was designed, a ToC was not required, though given the complexities, the design would have benefitted from a ToC.

28. The calculation of GHG emission reduction targets proposed on the ACE Project in the ProDoc assumed the generation of 69,115 tonnes CO_2 during cumulative to the end-of-project (EOP)[14]. This estimate was estimated using reasonable assumptions that included no expected RETPRLs in Year 1, and 40% of installations in Year 2. As such, this cumulative emission reduction target would meet the "achievable" criteria for SMART indicators if the Project was implemented according to the plans laid out in the ProDoc.

29. Overall, the quality of the PRF for the ACE Project can be rated as **satisfactory**.

3.1.2 Risks and Assumptions

30. The ACE ProDoc lists 11 external risks (Para 165 in ProDoc) and 11 internal risks (Para 166 in ProDoc). Examples of critical risks included:

- Failure to secure the necessary effective ongoing policy, management or financial support from MNRE, which will be the main project implementing agency and is the provider of most of the project's co-financing;
- Large and ongoing subsidies for certain favoured RETPRLs (e.g. solar water pumping for agriculture) leads to significant and unavoidable market distortions;
- Grid electricity supply is significantly extended to remote household enterprises instead of just some government facilities and some centrally located households in rural villages - and/or the hours per day, predictability, or quality (e.g. voltage regulation) of rural grid electricity supply improves significantly in the applicable project districts. This would make decentralised renewable electricity (DRE) less attractive for rural livelihoods applications;
- Applicable rural enterprises are unable to fund the necessary minimum level of equity (20%) of their RE technology cost to ensure strong enough beneficiary ownership of the RE – rural livelihoods applications;
- The Project is not able to find or to motivate additional RE technology and/or service providers to enter the market and to grow their businesses in rural livelihoods applications areas; and
- There is a lack of necessary leadership and/or slow or low-quality decision-making in the PMU.

While these are reasonable critical risks, the one risk that was not foreseen and would have been difficult to predict during the PPG Phase would have been the risk of "ambitious targets of Government in developing RE programmes with massive targets that prevent the project from being implemented through CLIAs but instead through the Government's own personnel at the national and state levels". This, in fact, was an important risk that was realized on ACE that is detailed further in Paras 45, 49, 50, 52, 68, 69, 76 and 77.

31. Overall, while the listing of internal and external risks is thorough, it should match the list of risks listed in Annexure A on Pgs 92-95 with mitigating actions. While this is a complete listing of the 22 risks for implementing the ACE Project, it is likely that not all these risks can be monitored by an implementation team. In keeping with the UNDP practice of only listing up to 6 risks in the ATLAS risk log, the listing of ACE Project risks should have been reduced to those with a higher level of risk, and recognizing limitations of the PMU in monitoring too many risks. A suggestion would be to consolidate these risks or reduce the risks to those that are being mitigated by the Project activities.

[14] Pg 71 of the ACE ProDoc

32. In Section 8.3 (Paras 168-172) of the ProDoc, the assumptions made for the ACE Project design are listed, and can be summarized as follows:

- continued support for the ACE project is assumed based on support expressed by government stakeholders at the central, state and local levels. MNRE was prepared in principle to set up a dedicated new programme focused on the enhanced use of RE for rural livelihoods applications;
- number and focus of the RE suppliers and the interest of the rural livelihoods related household enterprises will grow from the current levels with the interventions provided by the ACE Project. This would include applicable RET suppliers and service providers and rural livelihood support organisations (including but not limited to the Project-supported CLIAs) and rural livelihood-focused household enterprises;
- RE products are matured and the matching is appropriate and the RE product will operate for a duration as claimed.

These assumptions mostly align with the critical assumptions listed in the ACE PRF on pgs 71-75 of the ACE ProDoc.

3.1.3 Lessons from Other Relevant Projects Incorporated into ACE Project Design

33. The design of the ACE Project does not derive lessons from other projects, either government supported renewable energy support or donor-supported programs. It does, however, incorporate design features that are intended to support the GoI's wide range of policies and initiatives to support the expansion of renewable energy. This expansion of renewable energy is tied to achieving universal electrification, notably aligning with the Goi's Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) scheme that was replaced by the DDUGJY scheme in 2015 to support the extension of rural electricity supply in India (as mentioned in Para 25)[15]. Notwithstanding, there are still hundreds of thousands of unserved and underserved villages and household enterprises without the reliable electricity needed for household enterprises. As such, the supply of DRE to these villages is pivotal for reliable electricity supply to rural enterprises for many years provided that appropriate tariffs are possible and grid interconnection issues are resolved.

3.1.4 Planned Stakeholder Participation

34. The PPG Phase of ACE in 2014 involved consultations (formal and informal) with over 400 stakeholders, all involved in ACE's potential interventions in the RE and rural livelihoods application area. The stakeholders consulted during the PPG phase is extensive including persons from central government, state governments, NGOs, financial institutions, industry, and academic institutions, corporate organizations for CSR, private sector entities potentially involved with the delivery of renewable energy, international organizations and financial institutions; these stakeholders are listed on Table 23 in the ProDoc.

35. These consultations also revealed the extent of stakeholder willingness to participate on the project, most notably those in the selected clusters. Moreover, this strengthened the planned participation of stakeholders on the ACE Project considering the detailed discussions and their interest in accessing renewable energy for their livelihoods. This was demonstrated by cluster communities being

[15] RGGYV as of March 2014 had already electrified 124,139 villages and provided free electricity connections to 40.73 million below poverty line (BPL) rural households.

committed to mobilize resources to access RETs in addition to subsidies being provided by MNRE and the GEF-supported ACE Project[16].

36. The ACE Project plan for stakeholder participation was going to be a challenge, in consideration that a management arrangement would need a central government agency (MNRE) to provide benefits to rural communities. The management arrangements for ACE as depicted on Figure 1, illustrate the challenges of ACE activities engaging rural stakeholders through a Project Management Unit (PMU), and communicating with state governments (through state coordinators). State governments, in turn, would manage and oversee activities of CLIAs and CSOs, both of whom would have strong linkages with the beneficiary communities. For such an arrangement to properly function, the PMU would need to have a strong Project Manager (PM) with an administrative background complemented by specialists in renewable energy and rural livelihoods. While this management arrangement is robust for engaging stakeholders, recruitment of appropriate staff proved to be a challenge for the ACE Project, as detailed in Paras 51 and 68.

3.1.5 Replication Approach

37. The ACE replication approach is inherent in the project design with its activities to lower a number of barriers (technical, awareness, financial and regulatory) that would result in successful demonstrations of RETPRLs (Output 1.2) being scaled-up through replications (Output 1.4). The replication approaches also included, *inter-alia*, assisting in the development of cost-effective RETPRLs appropriate for beneficiary communities (Output 1.1); mobilize and pool existing RE and rural livelihood subsidies and support mechanisms at the central and state levels (Output 4.2.2); identify and implement improved pilot RE tariff and grid interconnection mechanisms (Outcome 3.1); and improving risk-sharing financial mechanisms for DRE in rural livelihood applications (Outcome 4.3). Successful removal of these barriers should then translate into the ACE Project supporting the sustained growth of DRE in the rural livelihoods sector by the EOP.

38. More specifically, ACE was designed to catalyze replication of RETPRLs by supporting the development and deployment of 10 key cost-effective RETPRLs in selected rural livelihoods sectors, and demonstrating them in their application to selected livelihood sectors within 3 states in 30 villages, and providing RE benefits to 1,500 household enterprises (Output 1.2). Other supporting activities for barrier removal included the provision of 14 training programmes and 7 training packages for the training of more than 280 trainers (Output 1.3). These trainers would be the key to replication of RETPRL deployment activities to other districts and states, resulting in RETPRLs to 28,500 household enterprises by the EOP (Output 1.4), and developed scale-up plans for each sector and RETPRL technology application in each participating state (Output 3.2.1). Outputs from Components 3 and 4 would also serve to facilitate RETPRL deployment to meet the target number of household enterprises through improving RE tariff structure for small-scale captive and off-grid RE, and to improve the financial support for DRE for rural livelihood applications. Overall, the replication approach for the ACE design appears logical.

[16] This included all 70 communities participating in the stakeholder meetings, committing to fixed amounts for the purchase and demonstration of RETs. These communities and possible RETPRLs were listed on Table 21 of the ProDoc.

3.1.6 UNDP Comparative Advantage

39. The ACE Project does have a distinct advantage to being implemented by UNDP in comparison to other donor agencies. The ACE Project was designed with activities to combine actual deployment of technologies on ground with building capacity of supply chain and building an enabling environment through policy interventions. With past donor projects on decentralized renewable energy (DRE) not combining all of these 3 activities on one project, the ACE Project design was unique in this aspect. UNDP's comparative advantage is its history of implementing these 3 activities.

40. The ACE Project was closely aligned with the Sustainable Energy for All (SE4ALL), a global initiative led by the Secretary-General of the United Nations, Ban Ki-Moon to achieve universal energy access, double the rate of improvement in energy efficiency, and double the share of renewable energy in the global energy mix by 2030. SE4ALL was launched in September 2011 and United Nations General Assembly unanimously declared the decade 2014-2024 as the Decade of Sustainable Energy for All. This SE4ALL alignment likely facilitated the release of TRAC funds to support the initial stages of ACE in late 2014 and early 2015, prior to the GoI signing of the ACE ProDoc in July 2015.

3.1.7 Linkages between ACE Project and Other Interventions within the Sector

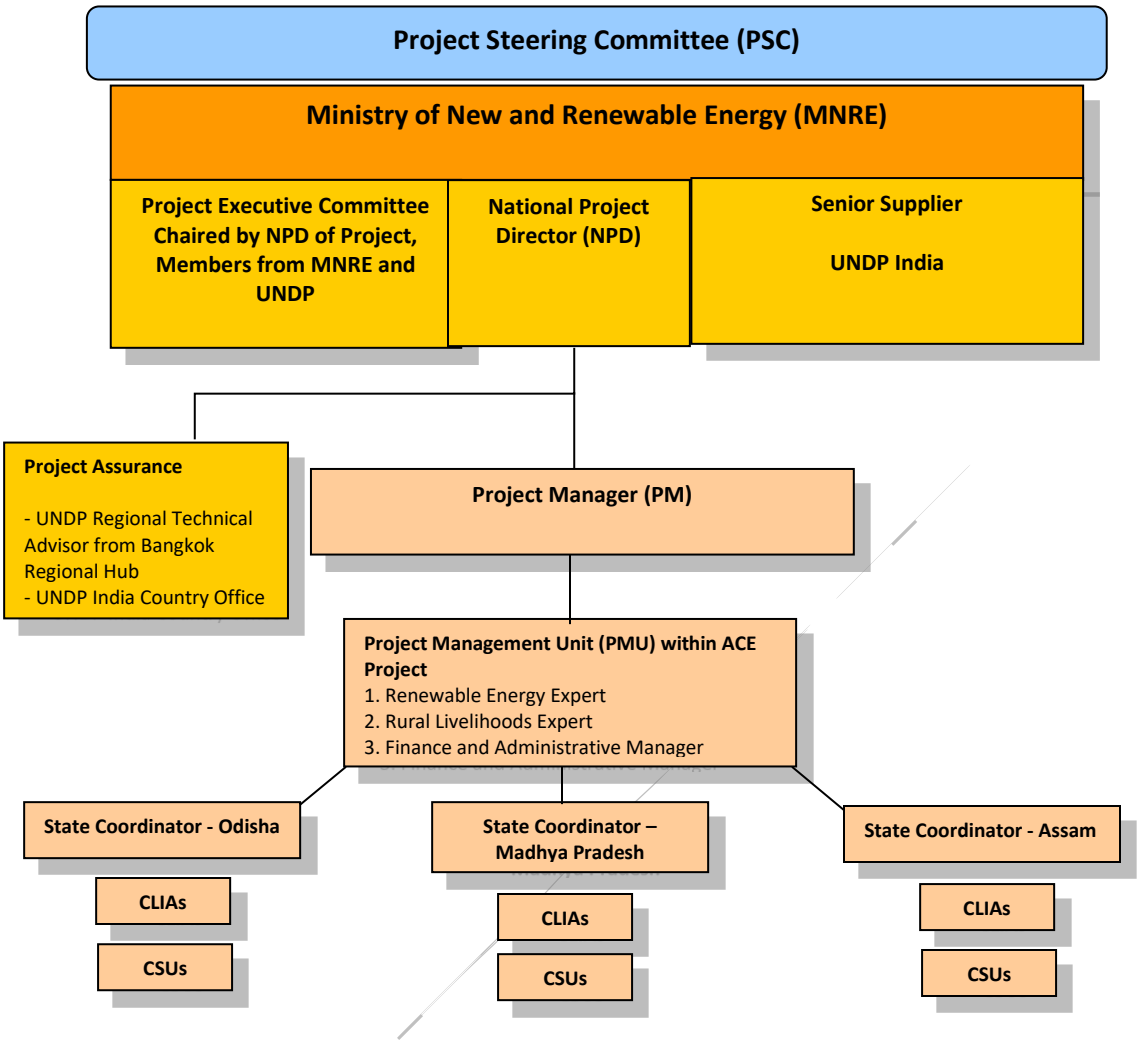
41. The ACE Project is linked with the GoI national programme, DDUGJY, and its predecessor scheme, RGGVY, to provide electrification to all rural communities in India as mentioned in Para 25. Despite the progress made under RGGVY that included the electrification of 124,139 villages and to provision of free electricity connections to 40.73 million rural households below the poverty line (as of March 2014), the number of unserved and underserved villages and household enterprises without the necessary reliable electricity remains high and significant. As such, the promotion and deployment of DRE for rural enterprises is crucial as a means of providing them with reliable electricity supplies. However, the ACE ProDoc does not mention any linkages with other GEF projects in India.

3.1.8 Management Arrangements

42. The management arrangements of the ACE Project to be implemented by MNRE are illustrated on Figure 1, and as mentioned in Para 36, were designed to link resources from a central government agency (MNRE) to generate renewable energy benefits at the rural level and to increase the likelihood of the ACE Project achieving its intended objective of "enhancing reliable and affordable clean energy access for rural livelihoods in un-served and underserved areas". As such, the ACE Project institutional structure was developed to provide integrated management and effective oversight to multiple cluster-level communities (as specified in the ProDoc) through the various state government agencies and MNRE. The various entities within the ACE management arrangements in the ProDoc included:

- the Project Steering Committee (PSC), chaired by MNRE's secretary that oversees project strategy with meetings conducted at least annually. The PSC was also to include UNDP, GEF (through MoEF), NRLM, IREDA, KVIC, NABARD, NTPC, DEA and representatives of the 3 state-nodal agencies (SNAs) for Assam, Odisha and Madhya Pradesh;
- the Project Executive Committee (PEC) which oversees project operations and scheduled to meet at least four times per year. The PEC is chaired by an MNRE Joint Secretary (JS), who would also serve as the National Project Director (NPD), and would include representatives of MNRE, UNDP, NRLM and SNAs;

Figure 1: Intended Management Arrangements for the UNDP-GEF Project "India ACE Project"



- the Project Management Unit (PMU) who are the core team for managing the operations of the Project. Through formal meetings at least once a month, the PMU would report to all PEC members for guidance and directives on executing ACE. The PMU was to be headed by a National Project Director (NPD) who would be a high-level MNRE official (Director) to provide a part-time oversight function. The PMU was also to be managed by a full-time National Project Manager (NPM) and three full-time staff members (a RE technical expert, a Rural Livelihoods social expert and a Finance & Administration officer). All full-time PMU positions were to be supported through GEF-ACE funds;
- Cluster-level implementation agencies (CLIAs) were tasked with the important role of managing the deployment of RETPRLs within 15 rural clusters across 3 states. Their roles included proposal development, liaising closely with relevant RE equipment suppliers, providing the required handholding to rural household enterprises for RE applications, day-to-day supervision and monitoring of RETPRL deployment, and communicating with the PMU for cluster-level monitoring and verification tasks. At the time of the ACE design, CLIAs were mainly NGOs strongly linked with the beneficiary clusters with GEF funds for RETPRL deployment to be disbursed from

the PMU to CLIAs, likely in the form of grants to be paid in instalments to the CLIAs over the first three years of the project;

- Cluster Support Units (CSUs) were setup in the ACE design to facilitate replication and scale-up activities after completion of the demonstrations by the CLIAs. Their role would be similar to extension officers (and likely spun off from CLIAs) where they would primarily provide day-to-day practical and technical support at the village and rural household enterprise level for a particular livelihood sector (such as poultry clusters). Each CSU would represent one livelihood sector who would be familiar with the RETPRLs being deployed;
- a state-level coordinator for each State Nodal Agency (SNA) who were to coordinate CLIA and CSU activities at the state-level, and serve as an extension to the PMU. These coordinators would receive overall guidance and support from the PMU based in the MNRE. The state-level coordinator positions were also to be supported through GEF-ACE funds;
- UNDP was to provide overall management and guidance from its New Delhi Country Office (CO) and from the Bangkok Regional Hub (BRH) in Bangkok that would include monitoring and evaluation (M&E) as per standard GEF and UNDP requirements.

43. To unpack the complexities of this management arrangement, the PPG team did develop a Project Operations Manual that could serve as a template for providing details of the key project roles, positions and proposed assignments essential to achieving the objective of ACE. In conclusion, this management arrangement was unique, providing some of the necessary linkages with rural communities to access RETs to promote their livelihoods. The impact of this arrangement, if properly implemented, would have been significant, especially given the potential for scale-up and the strong business case for the RETPTLs being promoted by the ACE Project.

3.2 Project Implementation

44. A compilation of key events and issues of ACE Project implementation is provided in chronological order and divided into the years of implementation. The following includes key ACE activities and issues of 2014 to 2016:

- 29 November 2014: ACE Project was launched in Bhubaneswar, Odisha by MNRE at a workshop in close collaboration with UNDP and the Government of Odisha, through the use of SE4ALL funds with UNDP. This event included 2 technical sessions on strategies for providing micro-enterprises with access to renewable energy, and selecting micro-enterprises for the piloting of RETPTLs in the livelihood sectors for horticulture, fisheries, dairy, poultry and bamboo;
- 13 May 2015: 1st ACE PSC meeting to prioritize clusters for technical and financial support for pilot projects, and providing clarity on implementation arrangements for disbursement of grant and subsidy funds directly by PMU to the CLIAs implementing pilots. Unfortunately, this was the only PSC meeting conducted for the ACE Project, but prior to the signing of the ACE ProDoc;
- 16 May 2015: ACE Inception Workshop prior to the signing of the ACE ProDoc that resulted in an update on ACE ProDoc RETPRLs, adopting key decisions ACE support for awareness raising and capacity building, and administrative roles of SNAs and CLIAs on deploying RETPRLs;
- 23 July 2015: ACE ProDoc signed;
- August and October 2015: *CLIA RFPs with the 1st (August 2015) and 2nd (October 2015) issued to 3 states for CLIAs (NGOs)* to deploy selected RETPRLs in communities. SNAs were tasked with identification of eligible communities, RETPRLs and assistance to these stakeholders to prepare proposals;

- August 2015 to July 2016: *Activities that were implemented to support preparation of RETPRL demo proposals by CLIAs and SNAs* included:
  - preparing specifications and benchmark pricing for 10 RETPRLs;
  - issuance of a compendium or RETPRLs prepared by the Odisha University of Agricultural Technology in March 2016;
  - conducting district level workshops in Assam, Madhya Pradesh and Odisha to familiarize SNAs with ACE Project that included the State Livelihood Missions (SLMs) in raising awareness of ACE;
  - posting of 25 Audio-Visuals (AVs) on RETPRLs on YouTube;
  - identification and approval of 720 enterprises by PMU-MNRE for deployment of RETPRLs involving SNAs and State Rural Livelihood Missions;
  - conducting 16 programmes and study tours to build capacity of stakeholders including RET suppliers, service providers, officials of SNAs and NGOs;
  - organizing and conducting 3 workshops to create awareness amongst officials from SNAs, regional rural bank officials on RETPRLs for adoption in their programmes; and
  - identification of 19 clusters in 3 states for demonstration projects;
- Early 2016: *SNAs prepared demo proposals for MNRE* for consideration of ACE funding as well as a linkage to a proposed MNRE subsidy scheme that was yet to be formulated. These proposals, were prepared without SNAs knowing how much funding they could expect from demonstrations and replication. In addition, SNAs were not given guidance on what RETPRLs should be deployed and the funding allocations amongst RETPRLs (as further detailed in Para 49). None of the SNA-developed proposals were sanctioned by MNRE (with some proposals finding funding in other places). Proposals from 2016 were never sanctioned by MNRE for a variety of reasons including an MNRE-imposing 30% subsidy cap in late 2016 for RE projects (that was in conflict with the 65-70% subsidy rates for rural projects in Assam, Madhya Pradesh and Odisha), and the need for redoing benchmark pricing due for new RE equipment being proposed[17];
- December 2016: *12 Odisha SNA proposals were sanctioned by MNRE* but without MNRE letters of intent to the proponents. Proposals from Assam and Madhya Pradesh, however, were never sanctioned due to the changes in MNRE strategy[18] which made it more difficult for CLIAs to comply with (further details in Para 49).

45. The following includes key ACE activities and issues from 2017 to the EOP of 23 July 2020:

- January-June 2017: *Informal move by MNRE to pivot away from CLIA (NGO) implementation*. By June 2017, only 3 Odisha CLIA proposals out of 12, fulfilled requirements for fund release by depositing 20% of project costs in a bank. At the same time, MNRE decided to rescind the sanction of the 12 Odisha proposals in favor of pursuing an MNRE-backed subsidy scheme (further details in Para 49);

[17] Another complication includes SNAs implementing a project, for example in Assam, where a typical state tender would obtain the lowest cost for an RET (such as a solar micro-pump). Since AEDA did not have clarity with regards to how the project was to be implemented, the tendered rate for an RET would be received but could not be sanctioned unless it matched the benchmark rate of MNRE. Since some of the RETs did not have benchmark rates, there was some confusion on how to conduct a state tendering process with ACE Project resources being housed under MNRE administrative rules. The delays caused by this issue and other issues resulted in SNAs losing credibility with stakeholders.

[18] The strategy change would have involved a new sanction letter that would have required the CLIAs to register in the government portal for NGOs, provide various documents, and plan for covering of 35% of the project costs, and placing at least 20% of project costs in a bank account as a prerequisite to get the first payment of the subsidy.

- 30 May 2018: 3 RE technology supply and service providers for rural livelihood applications short-listed for ACE support;
- 30 June 2018: *10 RETPRLs re-validated* using the MNRE-funded subsidy scheme, and SNA proposals for implementing solar micro pumps were received by MNRE-PMU proposing subsidies being directly managed by these SNAs, not NGOs[19];
- August 2018: *MNRE subsidy scheme formally launched* with only support for 30% subsidy;
- August-September 2018: SNA proposals were revived upon the launching of the MNRE subsidy scheme including:
  - Odisha: 0.5 Hp pumps (originally proposed in 2016), solar lighting for artisans; issues to be resolved at request of MNRE – OREDA did not respond and probably found other funding;
  - Assam: 0.1 Hp solar micro-pumps for horticulture, dairy, and solar cold storage for horticulture; and
  - Madhya Pradesh: PV systems for solar centers;
  - None of these proposals were sanctioned by MNRE as of December 2018;
- Late 2018, UNDP hired a consultant to prepare RETPRL proposals. This only resulted in the deployment in early 2019 of 6 solar cold rooms (2 in each state) that were 100% grant funded;
- MTR conducted between April to July 2019 followed by 4 letters (all during the 2nd half of 2019) from UNDP to MNRE to provide an official response to the MTR;
- Mid-2019, PMU lost its technical officer;
- ACE Project terminated on 23 July 2020 with MNRE not considering the recommendations of the MTR and not approving an ACE extension. This was the resulting outcome despite several UNDP-MNRE meetings between mid-2018 and 2020 on ACE progress and the need for its revival (see Para 49, last bullet).

3.2.1 Adaptive Management

46. Adaptive management is discussed in GEF terminal evaluations as a means to gauge Project performance and the ability of a project to adapt to changing regulatory and environmental conditions, common occurrences that afflict the majority of GEF projects. Without adaptive management, GEF investments will experience higher risks of not being effective in achieving their intended outcomes, outputs and targets.

47. The ACE Inception report from 13 July 2016 provides information on adaptive management measures undertaken in 2015 and early 2016 by MNRE to launch the Project. This included a number of changes and clarifications in the administration and implementation of Project activities, the key changes and clarifications as follows:

- Financial support for the demonstration projects for Output 1.2 for each livelihood sector should be up to 65% of the project cost or to a maximum of Rp 25 lakh (~US$35,000)[20] with funds from UNDP-GEF ACE Project;
- Similarly, financial support for projects in the scale-up phase (Output 1.4) should be limited to 30%;

[19] If an NGO defaults, a Chief Magistrate will request MNRE how the NGO was selected. In the case of a faulty NGO, an officer of the MNRE or the SNA will be the faulted for the selection, thereby penalizing that officer in the form of salary or pension from undertaking any similar type selections.

[20] As per the decision at the 1st PEC meeting on 7 August 2015 at MNRE

- A State Coordination Cell (SCC) was to be established in the SNAs of selected states for effective coordination with stakeholders, handholding of CLIAs on field implementation activities, and the M&E of all demonstration project. The SCC was to function under the supervision of the PMU. This replaces the State Coordinator mentioned in ProDoc;
- GEF grant funds were to be transferred directly by the PMU to the CLIAs.

48. Evidence of adaptive management being undertaken was documented on the minutes of the PEC meetings, 5 of which were conducted during 2015 and 2016[21]. During the early PEC meetings of 2015, coordination mechanisms with SCCs and SNAs and the setup of pilot projects for RETPTLs were topics that were managed for implementation. The 2016 PECs focused on the evaluation of project feasibility reports and benchmark costs to determine what RETPTLs would be supported by ACE, administrative steps to be taken to implement payments for RETPTLs being supported, and the selection of 11 pilot projects with RETPRLs. During 2016, the need for additional staff to manage these pilot projects was also identified by UNDP.

49. Notwithstanding that these adaptive management measures were intended to minimize deviations from ProDoc activities (including ACE Project assistance to CLIAs/NGOs and SNAs to prepare RETPRL proposals), they did not generate the intended results and the resulting outcome of ACE by 2017 and 2018 was unsatisfactory progress. Issues and corresponding management responses included:

- The 4th PEC meeting on 12 August 2016 with the decision that in future, CLIAs would need to provide security advances as for future payments to RET suppliers (MNRE-approved RET suppliers); this was to be done by placing 20% of their proposal cost in a separate bank account. The impact of this decision resulted in difficulties for CLIAs to comply with since most NGOs do not have such available cash for advance payments;
- The 5th PEC meeting of 10 October 2016 recommending 11 demonstration projects for financial sanction through 7 CLIAs in Odisha that included the release of Rs 20.11 lakh (~US$30,500) without the aforementioned security advances mentioned in the 4th PEC meeting. However, by mid-2017, MNRE never officially responded to CLIA proposals despite their approval during the 5th PEC meeting, causing many of the CLIAs (NGOs) and the SNAs to drop their proposals[22];
- Concerns within UNDP by March 2017 of the poor financial and physical deliveries of ACE[23]. At this point, UNDP perspective on the reasons for the poor progress included:
  - Continued lack of clarity regarding the benchmark costs of the various RETPRLs in the sanctioned CLIA proposals;
  - No clarity in the work orders to selected (sanctioned) CLIAs (NGOs) as mentioned in the 5th PEC meeting;
  - Continued lack of clarity of the role of SNAs despite partial descriptions in the minutes of the 1st, 2nd and 3rd PEC meeting minutes on the SNA and SCC roles. The SCCs needed to have

[21] 1st PEC meeting was 7 August 2015, 2nd PEC on 24 November 2015, 3rd PEC on 13 April 2016, 4th PEC on 12 August 2016, 5th PEC on 10 October 2016, 6th PEC on 30 June 2017 and the 7th PEC on 10 July 2018.

[22] By the end of 2016, the 11 pilot RETPRL projects developed by the CLIAs in Odisha had been financially sanctioned in the order of US$250,000 from the ACE budget. This sanction, however, came with conditions requiring the CLIAs to register in the government portal for NGOs, provide various documents, provide 35% of project costs, deposit at least 20% of project costs in a bank account to get the first payment of the subsidy. Given the challenge for NGOs to gather the required funds from beneficiaries to deposit into a bank account and additional issues with the national monetary system at that time, only three of the seven CLIAs with sanctioned projects met the requirements of the sanction letter and were delayed in doing so until around the same time the decision was made regarding the MNRE financial scheme, in August 2018. Other CLIA proposals were withdrawn.

[23] Through an internal UNDP memo around March 2017

a state-level Project Steering Committee to improve their monitoring functions and ownership of the RETPRL programmes as well as ToRs for SNAs and state-level PSCs for each of the states;

- Lack of appropriate PMU staffing that was agreed by MNRE in the ProDoc. Importantly, the experts in renewable energy and rural livelihoods were urgently needed on the PMU;
- Implementation arrangements in the ACE ProDoc that were agree to by all stakeholders including MNRE and UNDP, were not being followed. With the ProDoc designating only one CLIA per cluster, there were several NGOs already engaged in a cluster creating confusion on who was the designated CLIA; and
- Slow procurement through the MNRE-PMU. UNDP noted at the time of this internal memo that the 11 RETPRL proposals (mentioned in Para 48) had taken 15 months to identify but without on-ground implementation;

- MNRE's emerging position as of early 2017 on disbursement of GEF funds (which were considered GoI funds under NIM) was to minimize delivery time of RETPRLs to beneficiary communities, consistent with MNRE policy of maximizing benefits to end-users[24]. Compliance with this policy would have the impact of increasing the level of difficulty for NGOs (CLIAs) to participate on the Project, contrary to the modalities involving CLIAs as identified in the ProDoc and the confirmed information in the minutes of the 13 July 2016 Inception workshop (as mentioned in Para 47). UNDP was not officially aware of this policy until the 6th PEC meeting (see next bullet);
- The 6th PEC meeting of 30 June 2017 with the decision to float RFPs for RETPRLs on the MNRE website that would be submitted by SNAs (or State Level Implementation Committee or SICs). This decision was a response to the aforementioned MNRE policy of maximizing benefits to end-users, and to address the absence of a scheme for issuing subsidies for RETPRL deployment by linking the ACE Project with a proposed MNRE subsidy scheme. However, the SNAs were not clear of how to prepare these proposals including the context of technical and financial obligations of each stakeholder;
- Launching of the MNRE subsidy scheme in August 2018 that requests proposals from SNAs that caps subsidies (funds which are from the ACE Project) at 30%, in compliance with MNRE policy. The impact of this subsidy cap was the need for the addition of other funds (state subsidies or CSR funds) to bring subsidy levels above 90%, typical for rural development programmes. By late 2018, only 3 SNA proposals were received, none of which were sanctioned financially by MNRE;
- UNDP sought to facilitate proposals for the launching of the MNRE subsidy scheme by commissioning 2 studies to revalidate RETPRLs[25] and to support development of the RETPRL supply chain[26]. Unfortunately, the recommendations of these reports were never implemented due to the low number of applications for using the MNRE subsidy scheme;
- No PSC meetings were held during the entire 5-year duration of the ACE Project[27] which was supposed to be an opportunity for all stakeholders to be updated on the ACE Project on an

[24] In early 2017, ACE was under NIM and subject to GoI rules and regulations for fund disbursements. As such, the RETPRL proposals submitted by CLIAs came under scrutiny including CLIA cost recoveries for their services (for setting up demonstration RETPRL projects) which were up to 10% in some of the proposals. This was deemed too high as MNRE project management costs are capped at 2%.

[25] Revalidation of Renewable Energy Technology Packages and Rural Livelihood Sectors under the India ACE Project by IPE Global, March 2019

[26] Status of Supply and Service Providers for Powering Livelihoods using Renewable Energy in Assam, Madhya Pradesh, and Odisha, Villgro-CEEW, April 2019

[27] The Evaluation Team has one Office Memorandum of a PSC meeting notification to stakeholders on 17 October 2017. However, there are no minutes of this meeting, and thus, likely no official decisions taken at this meeting.

annual basis or more frequently if required, and to contribute to adaptive management of ACE. There was a PSC meeting on 13 May 2015, 2 months prior to the 23 July 2015 ACE commencement date. Instead, decisions regarding the strategic direction of ACE were made unilaterally by MNRE. Furthermore, the decision to shut down the ACE Project in 2020 was communicated to the GEF Focal Point at MoEFCC in a January 2020 memo. Two of the critical reasons for the shutdown were the absence of PMU staff and limited attention from MNRE on the ACE Project.

50. The issues listed in Para 49 and their corresponding "adaptive management" actions had significant impacts on the ACE Project, making it more difficult to achieving ACE goals and objectives:

- More than 18 months to arrive at the decision to designate SNAs through their SCCs to implement RETPRL contracts to communities;
- Almost 23 months for MNRE's official decision to pivot away from NGO execution of RETPRL contracts towards direct SNA contact with RET suppliers and service providers;
- SNAs difficulties in responding to the RFPs of MNRE (linked to the MNRE subsidy scheme) in 2017 and 2018 (Years 3 and 4 of a 5-year project). These difficulties were manifested by SNAs having to re-establish relationships with beneficiary communities after these communities and their CLIAs submitted proposals in 2015 and 2016. In addition, SNA's wanted a 70-80% central subsidy which were deemed not feasible for the RETPRLs identified by the Project. Despite the revalidation of the RETPRLs by (by IPE Global in 2018), the study was inconclusive, limiting the number of proposals submitted that were feasible for the 30% subsidy. Furthermore, the MNRE subsidy scheme with a 30% subsidy cap was increasingly less competitive with other schemes (mainly CSR foundations as noted in next bullet). The response by SNAs to the MNRE's call for proposals in 2017 and 2018 was predictably poor;
- Falling solar PV prices in India from 2016 to 2018 resulted in several solar-related RETPRLs becoming more available and affordable to villagers through CSR foundations and NGOs with higher subsidies than the ones being provided by the MNRE subsidy scheme. As such, village clusters could access RETPRLs through schemes other than the MNRE subsidy scheme that was tied to the ACE Project (further discussed in Para 81).

51. Another significant issue that was not adaptively managed was to provide adequate MNRE-PMU staffing according to the positions in the ACE ProDoc, staffing that was agreed upon by all stakeholders including MNRE. These staffing positions were important in managing complex institutional arrangements with the SNAs and SCCs to the communities and their RET suppliers and service providers to execute tasks related to the deployment of RETPRLs. While SCCs for the 3 states were each to be staffed with one technical officer and one consultant, for a total of six persons per SCC, Assam's SCC has just its technical officer (one person), with Odisha and Madhya Pradesh having no staff in its SCC. The PMU was not able to make any adjustments for the timely disbursement of SCC staff salaries, which were often delayed for up to 6 months and thoroughly discouraging efforts to retain SCC staff. More importantly, the MNRE-PMU was never fully staffed to manage these administrative tasks. Despite UNDP preparing tenders for the various PMU positions, MNRE never provided approvals for these recruitments, and as such the PMU was never fully staffed with recommended full-time Project Manager, as well as the Renewable Energy Expert, Rural Livelihoods Expert and the Finance and Administrative Manager. By early 2019, management of ACE was taken over by UNDP without any participation from MNRE.

52. In conclusion, efforts of ACE to adaptively manage this Project were ***unsatisfactory.*** This is in consideration that arrangements for deploying RETPRLs to communities had changed from working with CLIAs/NGOs to SNAs (starting in late 2016), having RETPRL pilots needing to be linked to the MNRE subsidy scheme (by late 2017), the resulting difficulties related to SNAs preparing RETPRL proposals by having to re-visit communities who had already submitted RETPRL proposals in 2015 and 2016, the emergence of other competing subsidy schemes that were better than the 30% subsidy offered under the MNRE subsidy scheme, and the understaffing of the PMU limiting the ability of the ACE Project to be properly managed.

3.2.2 Partnership Arrangements

53. Partnership arrangements at the commencement of the ACE Project were well defined in the ACE ProDoc to deliver the numerous outputs to achieve the Project objective of "enhancing reliable and affordable clean energy access for rural livelihoods in un-served and underserved areas". Considering the broad skill sets required to achieve this objective, effective partnerships with SNAs, CLIAs, RET suppliers and service providers, and rural communities were essential. The PPG Phase of ACE included fostering of partnerships, particularly with communities and CLIAs through informal meetings and workshops.

54. Partnerships were also to be setup through the PSC, to link:

- the National Rural Livelihood Mission (NRLM) with the MNRE as a measure to involve the State Livelihood Missions (SLM) and provide crucial linkages with the relevant livelihoods sectors and local communities. However, since the Project could not efficiently deploy RETPRLs as late as 2018, the SLMs for Assam, Odisha and Madhya Pradesh had little involvement with ACE;
- the heads of the SNAs for each of the 3 states for renewable energy, namely the state's Energy Development Agencies (EDAs), who were only to have a role in MNRE subsidy disbursement for the various RETPRLs promoted by the ACE Project. Their role and hence, partnership with ACE had grown starting in mid-2016 with MNRE requesting SNAs to respond to RFPs for RETPRLs. As mentioned in Para 50, SNA responses to the RFPs was poor, and partly attributed to SNA claims that there was a lack of specific guidance from MNRE on the administration of the proposals, the scope of RETPRL deployment (how many RETs and households to be involved), and the subsidies that were to be available to the households (prior to MNRE in 2018 stating its policy of a maximum 30% subsidy). For SNAs, its partnership with the ACE Project had considerably weakened after the launch of the MNRE subsidy scheme in August 2018;
- As mentioned in Para 49 (last bullet), no PSC meetings were held during the entire duration of the ACE Project, weakening any relationships between the MNRE and its PMU with SNAs, SCCs, SLMs, RET suppliers, service providers, CLIAs and beneficiary rural communities.

55. Furthermore, SNAs attempts to respond to the MNRE RFPs involved the re-visiting of communities that had submitted proposals through CLIAs in 2015 and 2016. Interviews with EDAs revealed this was not possible due to the reluctance of these communities and closely linked CLIAs to prepare another RETPRL proposal. Moreover, these communities had a lack of confidence with this process and not wanting to have another proposal being rejected.

56. In summary, overall efforts by the ACE Project to facilitate effective partnership arrangements with key stakeholders was **unsatisfactory** mainly due to the lack of any PSC meetings during the ACE

duration, changes made by MNRE to pivot away from CLIA implementation in 2017 and unexpectedly increasing the role of SNAs in RETPRL deployment without sufficient guidance from MNRE.

3.2.3 Feedback from M&E Activities Used for Adaptive Management

57. Evaluation of feedback from M&E activities was conducted using PIRs from 2017 to 2020. These PIRs provide reasonable detail in terms of progress issues, sufficient for identifying the need for adaptive management of ACE that could have improved the likelihood of timely delivery of outputs and generation of GHG emission reductions. While there was no PIR for 2016, the PEC meeting minutes (6 meetings overall from 7 August 2015 to 30 June 2017) provided adaptive management decisions made for the initial implementation stages of ACE. However, neither the PIRs and PEC meeting minutes reviewed provide the level of detail of the ACE delays as summarized in this report in Para 49. As such, feedback from M&E activities for adaptive management are rated as **moderately satisfactory**.

3.2.4 Project Finance

58. The ACE Project had a GEF budget of US$ 4,006,849 to be disbursed over a 5-year period. Implementation of Project activities started after the ProDoc signature on 23 July 2015. The aforementioned poor progress of ACE from 2015 to 2020 resulted in only US$736,711 being disbursed from the ACE Project, only 18.4% of the total ACE budget. Table 2 provides the known expenditures against the intended outcomes, mostly on Outcome 1 where funds were expended on solar cold rooms.

59. Table 3 provides ACE expenditures as per ATLAS codes. This table indicates that most funds were spent on:

- PMU salaries estimated at US$207,573 (under ATLAS code 71405) where there were no full-time staff;
- various consulting assignments estimated at US$168,074 such as the CEEE-Villgro report (under ATLAS code 72100);
- procurement and installation of the solar cold rooms estimated at US$130,013 (under ATLAS code 72401); and
- a nominal amount on travel estimated at US$40,706 (under ATLAS codes 71600).

Due to poor progress on deploying RETPRLs, negligible expenditures were made for Outcomes 3 and 4.

60. The ACE Project did not leverage any co-financing as indicated on Table 4. The Inception Report details changes in co-financing commitments from the ProDoc (as of July 2016) including the loss of US$4.5 million in co-financing from KVIC (US$0,.5 million) and NTPC and IREDA (US$4.0 million). If the Project had succeeded in deploying RETPRLs, co-financing would have been leveraged from state resources (possibly from SNAs, SLMs and financial institutes loaning rural communities funds for RETPRLs).

61. Overall, the cost effectiveness of the ACE Project has been **unsatisfactory** in consideration of the 18% of the GEF funds being spent with no delivery of almost all outputs and no achievement of any intended outcomes.

Table 2: GEF Project Budget and Expenditures for India ACE Project (in USD as of 23 July 2020)

ACE Outcomes	Budget (from ProDoc)	2015	2016	2017	2018	2019	2020	Total disbursed	Total remaining
Outcome 1: Deployment of RE-rural livelihood application packages	2,719,949	19,568	33,105	19,075	280,713	77,649	1,180	431,290	2,288,659
Outcome 2: Increased supply of RE technology and service providers for rural livelihood applications	301,000	28,412	551	30,240	140	12,252		71,595	229,405
Outcome 3.1: Inclusion of RE applications in national and state level rural livelihoods policies for key livelihood sectors in rural areas	196,700		24,586	44,877	-87			69,375	127,325
Outcome 3.2: Future MNRE programs also cater to actions towards enhanced RE utilization in rural livelihoods	46,600							0	46,600
Outcome 3.3: Improved tariff and grid interconnection regulations for decentralized RE	69,500							0	69,500
Outcome 4.1: Improved decentralized RE subsidies and support for rural livelihoods	64,800							0	64,800
Outcome 4.2: Enhanced provision of financial support for decentralized RE in rural livelihoods applications	119,900							0	119,900
Outcome 4.3: Improved investment risk mitigation for decentralized RE in rural livelihoods applications	298,900							0	298,900
Project Management	189,500	16,906	49,743	47,427	32,796	17,578		164,450	25,050
Total (Actual)	4,006,849	64,886	107,985	141,619	313,561	107,479	1,180	736,711	3,270,138
Total (Cumulative Actual)	4,006,849	64,886	172,871	314,490	628,052	735,531	736,711		
Annual Planned Disbursement (from ProDoc)	4,006,849	217,910	715,970	875,420	836,495	910,095	450,959		
% Expended of Planned Disbursement (from ProDoc)		**30%**	**15%**	**16%**	**37%**	**12%**	**0%**		

Table 3: GEF Project Expenditures for India ACE Project against ATLAS codes (in USD as of 23 July 2020)

ATLAS Code	Expenditure Description	US$
33001	Accounting adjustments	876.11
64397	Internal staff changes	7,537.94
71205	International Consultants	18,228.33
71305	Local Consultants	123,548.07
71405	Service Contracts - Individuals	207,573.39
71605	Travel	40,705.66
72105	Contractual Services - Service Companies	168,073.54
72401	Prefabricated structures and other buildings	130,012.51
72505	Office supplies	6,654.31
72805	Acquis of Computer Hardware	141.31
73125	Common Services-Premises	2,525.00
74110	Audit fees	1,745.91
74210	Printing and Publications	17,316.30
74525	Sundry	9,156.24
75705	Training	4,905.51
76120	Foreign exchange	-2,289.07
	Total:	**736,711.06**

Table 4: Co-Financing for India ACE Project (as of 23 July 2020)

Co-financing (type/source)	UNDP own financing (million USD)		Government (million USD)		Partner Agency (million USD)		Private Sector (million USD)		Total (million USD)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants	0.800	0.000	10.000	0.000			8.234	0.000	19.034	0.000
Loans/Concessions									0.000	
• In-kind support									0.000	
• Other									0.000	
Totals	0.800	0.000	10.000	0.000	0.000	0.000	8.234	0.000	19.034	**0.000**

3.2.5 M&E Design at Entry and Implementation

62. The M&E design of the ACE Project is contained in Section 14 of the ProDoc. The M&E design of the ACE Project is comprehensive as well as standard to other similar GEF projects within UNDP. The design included the inception workshop and report, measurement of means of verification for project results and progress, PIRs, midterm evaluations, final evaluations, audits, and visits to field sites. However, considering the issues with respect to adequate staffing of the PMU and the SCCs (both key stakeholders in the timely deployment of RETPRLs), the M&E design should have included monitoring activities that include monitoring of institutional arrangements though this is not considered as a standard M&E design practice. As such, the M&E design is rated as **moderately satisfactory**.

63. Implementation of the M&E design commenced with the Inception Workshop held on 13 July 2016, almost one year after the signing of the ProDoc. The Inception report also provided information of the numerous ACE activities beginning with the Project Launch of 29 November 2014 (almost 8 months prior to the ProDoc signing) and numerous awareness raising and technical workshops in the 3 states and in New Delhi up to mid-2016.

64. Despite strong Project ownership demonstrated during time of the Inception report, and ACE progress being provided on other reports available to the Evaluation Team (namely the QPRs from 2015 to 2018 and the PIRs from 2017 to 2020), these reports do not provide much information on the emergence of issues involving moving away from CLIA execution on ACE (as summarized in Para 49) that unofficially began in late 2016. Documentation of any of these issues first arose in the MTR that was originally scheduled for late 2017 but delayed until April 2019[40].

65. Furthermore, as mentioned in Para 49 (last bullet), there were no PSC meeting throughout the duration of ACE. This had the impact of not informing ACE stakeholders of the lack of progress and related issues, involving them in any adaptive management decisions to rectify progress issues, and raising the possibility of a) the likelihood of unilateral decisions being made by MNRE on the strategic direction of the ACE Project; or b) MNRE not having sufficient interest in the ACE Project to invest appropriate efforts to properly manage the Project.

66. Unfortunately, the value of the MTR was limited with the ACE Project being only 16% expended almost 4 years into a 5-year project, and with minimal participation by MNRE as of early 2019. The PIRs for 2019 and 2020, which were prepared by UNDP, were indicative of the difficulties being experienced on ACE (as mentioned in Para 49) to meet any of its targets and outcomes.

67. In conclusion, the content of the QPRs and PIRs provides information on the progress of ACE, but without documentation of the implementation issues (that occurred prior to 2017 but summarized in Para 49 in this report). In addition, there were no PSC meetings during the entire duration of the ACE Project and the MTR was held too late into ACE to be of any value in adaptively managing ACE. As such, *M&E plan implementation is rated as **moderately unsatisfactory***. Ratings according to the GEF Monitoring and Evaluation system[41] are as follows:

[40] Reasons include MNRE requesting a delay to allow the Project some time to progress with its new linkages to the August 2018 MNRE subsidy scheme, and several months delay in late 2018 and early 2019 due to local elections.

[41] 6 = HS or Highly Satisfactory: There were no shortcomings;
5 = S or Satisfactory: There were minor shortcomings,

- *M&E design at entry - 4;*
- *M&E plan implementation – 3*
- *Overall quality of M&E - 3.*

3.2.6 Performance of Implementing and Executing Entities

68. The performance of the implementing partner of the ACE Project, MNRE, can be characterized as follows:

- Since the commencement of ACE in July 2015, there have been 4 MNRE-NPDs;
- Ownership of ACE by MNRE during its early stages (2015-16) was strong. However, the emergence of issues with regards to CLIAs (NGOs) executing RETPRLs for rural communities was an unforeseen and unfortunate management change, somewhat external to MNRE. Moreover, this change thrust SNAs into a central role in deploying RETPRLs with the most eligible communities being those that had already submitted proposals through CLIAs. This scenario made it difficult for SNAs and the ACE Project to meet its important targets for GHG emission reductions, energy savings and households adopting RETPRLs from demonstrations and replication;
- Since MNRE served as the Implementing Partner under NIM, the PMU for ACE was to be officially located in MNRE's offices in Central New Delhi, and staffed with an NPD, NPM, RE Expert, Rural Livelihoods Expert, and a Finance and Administration Manager. However, throughout the course of ACE, the staffing levels of the PMU were never fulfilled, a likely cause for the slow and uneven Project performance from throughout the duration of the project[42]. Difficulties for ACE to retain their PMU staff were directly related to poor progress on ACE;
- The lack of PMU staffing was also a likely cause of the unsuccessful launching of the SCCs (as per Inception workshop decision as mentioned in Para 47) that also resulted in uneven levels of staffing, in part due to the salaries of SCC staff being disbursed through MNRE that were sometimes delayed by up to 6 months[43];
- During the entire duration of ACE, MNRE outreach to the SNAs was very limited and personnel who had relevant experiences in rural livelihoods and renewable energy application, were not directly involved from the MNRE side with the SNAs;
- After 2017, MNRE's involvement with ACE was minimal. Since MNRE no longer provided fiscal and physical progress of the ACE Project, UNDP undertook this role in an attempt to kickstart ACE towards RETPRL deployment with rural communities;
- Overall failure of MNRE to consider in a timely manner an alternative course for implementation of ACE and the deployment of RETPRL demonstrations, so crucial to the replications and the

4 = MS or Moderately Satisfactory: There were moderate shortcomings;
3 = MU or Moderately Unsatisfactory: There were significant shortcomings;
2 = U or Unsatisfactory: There were major shortcomings;
1 = HU or Highly Unsatisfactory
U/A = Unable to assess
N/A = Not applicable.

[42] ACE did not have an NPM from July 2015 through most of 2016. In 2017, there was a full-time NPM based at UNDP along with 2 technical officers, 2 administrative/financial assistants, and a general assistant. As of 2018, there was a part-time NPM, still based in UNDP but with full-time responsibilities for overseeing another UNDP-GEF project. As of mid-2019, the PMU had 2 full-time staff (a technical officer and administrative assistant), both based in MNRE.

[43] During the 2016-2018 stages of ACE, SCCs for each of the 3 states were staffed with one technical officer and one consultant (an assisting role), all based in their respective SNA offices. By mid-2019, Assam's SCC has just its technical officer and the SCCs for Odisha and Madhya Pradesh with no staff.

achieving of other outcomes (Outcomes 2, 3.1, 3.2, 3.3, 4.1, 4.2 and 4.3). The request for SNAs to prepare proposals was not successful, with the SNAs in 2016 and 2017 not receiving guidance for proposal preparations, and real SNA proposals finally being prepared after the August 2018 launch of the MNRE subsidy scheme, during Year 4 of a 5-year project;

- As mentioned in Paras 49 and 65, MNRE did not hold any PSC meetings during the 5-year duration of ACE, and not sharing the issues of the ACE Project with other relevant stakeholders such as the SNAs and SLMs;
- Overall performance of MNRE on the ACE Project is assessed as being **unsatisfactory**.

69. The performance of UNDP (the Implementing Agency) has been difficult to evaluate considering the unexpected events during the first 2 years of ACE. An attempt to evaluate UNDP's performance follows:

- Considering MNRE's unexpected move away from CLIAs executing contracts for RETPRL deployment as of late 2016, UNDP was placed in a difficult position of supporting the ACE Project to meet its intended targets. This included difficulties in how UNDP in late 2016 could have mitigated delays in deploying RETPRLs when CLIAs were told to provide security deposits prior to starting their contracts during late 2016. Notwithstanding that UNDP prepared ToRs for various PMU positions as early as mid-2015, MNRE did not provide approval for the recruitment for the full complement of PMU staffing as recommended in the ACE ProDoc (though PMU experts for renewable energy and rural livelihoods were recruited in 2016, the livelihood expert left in 2017 and the renewable energy expert left in 2019). This likely contributed to the slow pace of implementation with a complex management arrangement;
- Despite the risk analysis of the ACE Project being "medium", several of the identified risks in the ProDoc in hindsight could have been rated as "high", placing the ACE Project in a higher risk category. These high risks were likely contributors to MNRE difficulties in the implementing ACE, to which UNDP initiated discussions with MNRE to offer country office assistance to undertake any required actions to reduce these risks. This did not occur due to no official response from MNRE on this offer though in reality, the ACE Project was being operated under a NIM with Country Office support after late 2018;
- With limited participation of MNRE on ACE after late 2018, UNDP was effectively managing ACE but with no documentation of management decisions and little to no evidence of collaboration from MNRE (as evidenced from UNDP correspondence to MNRE in late 2019 after the MTR);
- There was little input from UNDP's RTA prior to 2018, a crucial period of ACE implementation when support from an RTA may have resulted in management actions to mitigate the poor progress. After 2018, ACE had regular RTA inputs;
- Overall performance of UNDP on the ACE Project can be assessed as being **moderately satisfactory**, mainly due to UNDP's attempts to support ACE after UNDP was placed in a difficult position of supporting the Project after the unexpected move of MNRE away from CLIAs.

70. A summary of ratings of the implementing and executing entities of the ACE Project are as follows:

- *Implementing Partner (MNRE)* – 2;
- *Implementing Entity (UNDP)* – 4;
- *Overall quality of implementation/execution (UNDP/MNRE)* – 3.

3.3 Project Results

71. This section provides an overview of the overall project results and assessment of the relevance, effectiveness and efficiency, country ownership, mainstreaming, sustainability, and impact of the ACE Project. In addition, evaluation ratings for overall results, effectiveness, efficiency and sustainability are also provided against the July 2015 Project PRF (as provided in Appendix F)[44]. For Tables 5 to 9, the "status of target achieved" is color-coded according to the following scheme:

Green: Completed, indicator shows successful achievements	Yellow: Indicator shows expected completion by the EOP	Red: Indicator shows poor achievement – unlikely to be completed by project closure

3.3.1 Overall Results

72. A summary of the achievements of ACE Project at the Project Goal and Objective level with evaluation ratings are provided on Table 5.

73. Cumulative emission reductions and energy savings from RETPRL installations on the ACE Project only reached 338 tonnes CO_{2eq} and 378 MWh_e from only 6 solar cold room installed in late 2019, reflective of the difficulties experienced by ACE in deploying RETPRLs within rural communities.

Table 5: Project-level achievements against ACE Project targets

Intended Outcome	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating[45]
Project Goal: *Reduced GHG emissions achieved through renewable energy systems in rural livelihood sectors*	Cumulative CO_2 emission reduced from start of project to End-Of-Project (EOP), (tCO_{2e})	0	69,115	*~338*	*From solar cold rooms that were deployed in late 2019 by the Project.*	2
Project Objective: *Enhancing reliable and affordable clean energy access for rural livelihoods in un-served and underserved areas*	Total energy savings achieved from implemented RETPRLs by EOP in MWh_e	0	112,737	*378*	*From solar cold rooms that were deployed in late 2019 by the Project.*	2
	Total energy savings achieved from implemented RETPRLs by EOP in MWh_{th}	0	1,376,631	*0*	*There were no RETPRLs deployed that resulted in thermal RE energy saving*	1
Overall Rating – Project-Level Targets						**2**

3.3.2 Component 1: Development and deployment of key RETPRLs

74. To achieve Outcome 1, "established and regular update of renewable energy utilization baseline & energy intensity reference baselines for the energy generation and end-use sectors)", ACE Project resources were to be used to:

[44] Evaluation ratings are on a scale of 1 to 6 as defined in Footnote 41.
[45] Ibid 41

- deliver at least 10 cost-effective RETPRL applications and established technical specifications (Output 1.1);
- demonstrate and documented RETPRLs in 15 clusters and benefitting 1,500 household enterprises (Output 1.2);
- complete training programmes and training of trainers activities for replication and scale up of RETPRLs (Output 1.3);
- completed promotion of replicated and documented RETPRLs promoted to other districts and states and applied to 28,500 household enterprises (Output 1.4).

The Project achievements in delivering this outcome are summarized on Table 6.

75. The actual implementation of activities to achieve Outcome 1 included the preparation of demo proposals, determining of specifications and benchmark pricing for selected RETPRLs, study of livelihood and RETPRL markets, preparation of a compendium of RETPRL technologies and conducting workshops for training and raising awareness. The preparation of proposals, however, could be divided into three phases based on decisions made from 2015 to 2018, as summarized under the section on adaptive management (Paras 47 to 51):

- demo proposal preparation by the CLIAs in 2015 and 2016;
- demo proposal preparation by the SNAs between 2016 and 2018 that was also linked to the June 2017 conception and August 2018 launching of the MNRE subsidy scheme; and
- ramping up deployment and commissioning of solar cold rooms by UNDP in late 2018 and early 2019.

76. Demo proposal preparation by the CLIAs in 2015 and 2016: The preparation of CLIA proposals was mainly conducted through NGOs, but also included companies and academic or research institutes. As per the August 2015 PEC decision and as detailed in the Inception Report (Para 47), demonstration RETPRLs (Output 1.2) were to be supported through ACE resources equivalent to a subsidy of 65% of the total demonstration RETPRL cost (up to a cap on total project cost of Rs 2.5 million or ~$36,000) with the CLIA receiving an additional 15% of the subsidy amount for their services. Though 3 RFPs for CLIA proposals were issued, shortlisted proposals were reviewed for the first two (the first RFP in August 2015 and the second RFP in October 2015)[46]. Over 200 proposals were received with 69 shortlisted (23 in Assam, 21 in Madhya Pradesh, and 25 in Odisha as listed in Appendix H). After the shortlisting of CLIA proposals, a number of issues emerged hindering efficient progress of RETPRL deployment towards the target of 1,500 households:

[46] ACE Project resources were used in August 2015 to issue an EoI to shortlist potential suitable CLIAs. EoIs were posted on the UNDP India website, through UN solution exchange-climate change community platforms, all with a concerted aim of qualifying CLIAs to a maximum of five agencies per cluster. Further support to this process was provided by UNDP to reach agencies at the grassroot levels with pre-EoI meetings at state headquarters in Guwahati, Bhubaneswar and Bhopal in the states of Assam, Orissa and Madhya Pradesh respectively, and district level workshops during the period of November to December 2015. These workshops also provided an opportunity to involve the State Livelihood Missions and the topic of MNRE policy of a 30% cap on all of their administered RE projects (important since Assam, Madhya Pradesh and Odisha were accustomed to 65-70% subsidy rates for their projects). These events were attended by UNDP representatives from programme and procurement divisions as well as MNRE representatives. Notwithstanding, 45 applications from CLIAs were received by late 2015.

Table 6: Outcome 1 achievements against targets

Intended Outcome/Output	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating [47]
Outcome 1: Deployment of RE-rural livelihood application packages	No. of household enterprises adopting RETPRLs through demonstrations and replications in the targeted states by the EOP	0	30,000	*60*	*These 60 households are benefitting from 6 - 5 tonne solar cold storage rooms that were installed in all 3 states (2 in each state).* *This indicator needs to be different from Output 1.4. See Para 27.*	2
Output 1.1: At least ten (10) cost-effective RE technology packages developed for rural livelihood (RETPRL) applications and established technical specifications	No. of RETPRLs developed by Year 2	0	10	*10*	*10 new pilot proposals from the States of Assam (5), Madhya Pradesh (4) and Odisha (1) were developed and submitted to MNRE under the ACE scheme as of mid-2017. These proposals, however, were never approved for implementation by MNRE.*	5
Output 1.2: Demonstrated and documented RE – rural livelihood application packages in 15 clusters and benefitting 1,500 household enterprises	No. of demonstration project clusters by EoP	0	15	*19*	*Revalidation exercise was carried out for the 19 clusters as per the operationalized MNRE scheme*	4
	No. of household enterprises adopting RETPRLs in demonstration clusters by Year 3	0	1,500	*60*	*These 60 households are benefitting from 6 - 5 tonne solar cold storage rooms that were installed in all 3 states (2 in each state). However, there are no studies of the economic benefits of solar cold rooms.*	2
Output 1.3: Completed training programmes and training of trainers activities for replication and scale up of RE – rural livelihood application packages	No. of training programmes conducted by EoP	0	14	*22*	*This includes 6 training programmes on the benefits, use and maintenance of solar cold rooms at six different locations.*	4
	No. of training packages developed by Year 2	0	7	*1*	*Only 1 training package developed for cold storage in last reporting period*	2
	No. of persons trained by EoP	0	280	*480*		5
Output 1.4: Completed promotion of replicated and documented RE – rural livelihood application packages promoted to other districts / states and applied to 28,500 household enterprises	No. of household enterprises adopting RETPRLS through replications by EoP	1,500 (at the end of demonstration)	30,000	*60*	*No progress on replicating solar cold rooms since these RETPRLs were only deployed in 2019 with insufficient time for replication activities.* *This indicator needs to be different from Outcome 1. See Para 27.*	1
Overall Rating – Outcome 1						**3**

[47] Ibid 41

- the first round of sanctions for 11 projects in Odisha were issued with sanction letters sent to 7 CLIAs in December 2016, *more than 12 months after the proposals were submitted*. The sanction letter required the CLIAs to register in the government portal for NGOs, provide various documents, and plan to provide 35% of the demonstration costs, advancing at least 20% of demonstration costs into a bank account to get the first subsidy payment. The impact of these conditions resulted in only 3 CLIAs being able to meet these fiscal conditions by summer 2017;
- the proposals from Assam and Madhya Pradesh were never sanctioned due to changes in MNRE's strategy commencing in early 2017 in pursuing the setup of their official subsidy scheme and to not work with the CLIAs/NGOs. The decision to not to work with CLIAs/NGOs was made official by MNRE in June 2017, 6 months after the sanction letters to the CLIAs were issued. However, there was no official correspondence from MNRE to "cancel" the sanctioned demonstration RETPRL proposals from CLIAs.

77. Demo proposal preparation by the SNAs between 2016 and 2018: SNAs had also submitted proposals to MNRE for funding RETPRL demonstrations from early 2016 to late 2018. In 2017, PEC discussions did mention RETPTL proposals would be floated through MNRE on their website. During 2018, another round of RETPTL proposals were to be submitted in response to the MNRE RFP call by 10 August 2018 and tied with the MNRE subsidy scheme that launched in August 2018. These proposals, however, involved the SNAs attempting to go back to the communities to re-submit the same 2015-16 proposals but with linkages to the MNRE subsidy scheme. Due to the reluctance of these communities to re-engage, the number of re-submitted these proposals was limited to 3, and were generally prepared without information on the amounts of funding they could access for the demonstrations as well as replication. In addition, SNAs were not provided guidance on the types of RETPRLs to be demonstrated nor how funding allocations would be distributed amongst the various RETPRLs[48]. By the EOP, none of these SNA proposals were sanctioned by MNRE, with some of them having found other sources of funding. The 2016 SNA proposals were actually from Odisha that were later revised to suit the MNRE subsidy conditions such as reducing the proposed MNRE/ACE subsidy to only 30%, and SNA service fees to 3% (based on the subsidies disbursed under the scheme) in comparison with a 65% subsidy and 15% service fees to NGOs under the CLIA proposals. Each of the proposals from the SNAs to MNRE have been delayed for a myriad of reasons as listed in Table H-4 in Appendix H. One of the largest proposals was for 980 of 2,500 - 0.5 HP pumps targeted by OREDA which was delayed in being sanctioned due to MNRE needing to redo benchmark pricing for these 0.5 HP pumps.

78. Ramping up deployment and commissioning of solar cold rooms by UNDP in late 2018 and early 2019. This initiative was driven by UNDP with MNRE consent at the end of 2018 and in early 2019 in an effort to kickstart RETPRL deployment by planning and installing 6 solar cold storage units (2 in each state) with 100% of the costs covered by ACE funds. As of July 2020, these 5-ton solar PV cold storage units were slowly being adopted by local farmers to extend the shelf life of wilting leafy greens in the unit. The MTR team reportedly visited one of these installations in Assam in 2019, noting that a farmer's association representing 500 farms owns one unit. Both of the units in Assam are now being used to store leafy produce and spices as a means of maximizing the price of the price of their products. The Assam State Livelihood Mission played a key role in technical assistance to the

[48] The reaction of the SNAs to developing RETPRL demonstrations was poor. Some of the states claimed that the Project did not adapt to some of the unique characteristics of each of the states, in particular, Assam, which has similarities to southeast Asia in terms of its hilly terrain, abundant water resources, and small land holdings that only require 2-3 kW of power for each household (MW not required for their livelihood sector). The SNA of Assam, AEDA, mentioned that sharing of SE Asian RE technologies used under similar topographical conditions would have been useful to Assam RE stakeholders for further promotion.

farmers in using the solar cold storage units. Despite initial scepticism of providing a 100% grant (or Rs 1.4 million or US$20,300) to install these units and a subsequent lack of beneficiary urgency to utilize the technology in an economically viable manner, the Assam SNA reported in mid-September 2020 that these units are now fully utilized with other communities showing signs of interest. Though the US$20,300 price is well above the MNRE benchmark price of Rs 900,000 (US$13,000) for these 5-ton solar cold storage units, it is highly likely that the price will be lower if there is genuine interest of other communities in this technology that may result in future bulk purchases of these units.

79. Other activities driven by UNDP in late 2018 to kickstart RETPRL deployment included:

- commissioning a consultant to work with the Madhya Pradesh SNA to prepare 4 RETPRL demo proposals[49]. These proposals, however, ran into a number of difficulties including:
  - 2 of these proposals (for rooftop PV system for sewing centres and rooftop solar PV systems with battery backup for NTFP collection centres) were requesting 100% subsidies;
  - the rooftop PV system for sewing centres was reliant on revenues from net metering for its viability rather than productive use of power for livelihoods;
  - a proposal for 19 pumps to be shared in a community for 401 farmers that requested more than the 30% subsidy allowed under MNRE schemes; and
  - the installation of 25 5-ton cold storage units in a community that would require local farmers to shift from grain farming to vegetable farming. Despite the involvement of the Madhya Pradesh SLM, there was no follow-up to this proposal;
- a consulting firm, IPE Global, completing a March 2019 draft report "Revalidation of Renewable Energy Technology Packages and Rural Livelihood Sectors under the India ACE Project" to update an assessment of livelihoods in the 3 pilot states and their demand for RETPRLs. The work was conducted through interviews with the SNAs, the SRLMs, and equipment providers. Findings indicated a re-validation of the original RETPRLs that are still in demand with more RETPRLs being added to the original listing. The findings of this study, however, were not based on fieldwork, but short visits to each of the three states. As such, the quality of the IPE report findings, were deemed to be highly dependent on the quality of information received from third-party interviewees. Priority RETPRLs included solar water pumps for irrigation and fisheries and solar-based charkhas and looms, the second priority of which is deemed to be of secondary importance in comparison to RETPRLs associated with horticulture, dairy, poultry, and fisheries, all considered primary livelihoods. Furthermore, the report is focuses primarily on RETPRL demand, and does not cover how these RETPRLs (such as lighting and pumps) are receiving existing support from other schemes. In conclusion, the March 2019 IPE report could have been useful in deployment of additional RETPRLs on the ACE Project. The report, however, did not catalyse the deployment of more RETPRLs after March 2019 due to the lack of ACE-PMU personnel and lack of participation from MNRE.

80. In summary, reasons for these delays and inability of the ACE Project to rapidly deploy RETPRLs to meet its demonstration target of 1,500 households adopting RETPRLs include:

- the ACE-PMU never being fully staffed to manage the institutional complexities with rural communities as mentioned in Paras 51 and 68;

[49] These proposals are outlined on pgs 16-17 of the ACE MTR Report of July 2019.

- the ACE ProDoc was not sufficiently clear on the specifics for developing RETPRL demonstrations and the compensation structure for CLIAs/NGOs which was determined in PEC meetings in 2015 and 2016 (as detailed in Para 49);
- MNRE pivoting away from CLIAs/NGOs and having SNAs after 2016 be the focal points of RETPRL deployment when they were not well equipped for undertaking this task (as detailed in Para 49). This led to numerous delays and studies to determine RETPRLs to deploy followed by the determination of baseline costs for selected demonstration RETPRLs;
- Efforts by UNDP to ramp-up RETRPL deployment in late 2018 were not sufficiently followed up by MNRE and UNDP due to the issues with the RETPRL proposals as outlined in Para 79, and the lack of dedicated PMU and SCC staff to follow-up on the RETPRL recommendations of the IPE report.

81. In addition to the reasons in Para 80, differentiation of the ACE Project from other projects and programs involving RETPRLs in 2019 was not as obvious as it once was when ACE was designed in 2014 and "RE for livelihoods" was a fairly new concept in India. Thus, in terms of the requirement that UNDP-GEF projects address needs that would otherwise not be addressed in the absence of a project, there was a need in 2019 to better understand the relevance of the ACE Project. Between 2015 and 2018, the RE market in India had changed significantly with solar PV equipment becoming significantly less costly (as first mentioned in this report in Para 50). This resulted in the growth of a number of other RE pilots for livelihoods throughout India, such as those supported by SELCO and Harsha Trust complete with competitive subsidy schemes, and involving RETPRLs that ACE had intended to support, notably PV lighting and PV pumps. Notwithstanding these market changes, the ACE Project was unable to adaptively manage its activities to adapt to these changing market conditions that could accelerate the pace of RETPRL deployment to meet ACE targets.

82. In conclusion, the results of Component 1 are rated as **unsatisfactory** based on failure to deliver 2 key targets on ACE, namely "1,500 household enterprises adopting RETPRLs in demonstration clusters by Year 3", and "30,000 household enterprises adopting RETPRLS through replications.

3.3.3 Component 2: Supply chain for RE technology supply and service providers for enhancing rural livelihoods

83. Under this Component, Outcome 2 of "increased supply of RE technology and service providers for rural livelihood applications" was expected using ACE Project resources to deliver "business development aspects supported for 100 RE technology supply and service providers for rural livelihoods applications" (Output 2). Progress towards delivering this outcome are summarized on Table 7.

84. Work to achieve Outcome 2 was first carried out in 2016 with an RFP for RETPRL suppliers to set up entrepreneurial hubs in India ACE project states, initially targeting the establishment of 2 hubs per state for a total of 6. The RFP explained that it sought "rural entrepreneurs for establishing infrastructure for entrepreneurial hubs for assembling, supplying, after-sales servicing, training of technicians/operators of off-grid RE systems or devices for rural livelihoods in identified districts of the states of Assam, Odisha and Madhya Pradesh." ACE resources were to cover 77% of the cost of the proposals (Rs 1 million or US$14,500 per entity) with the remainder to be secured from other sources. With 23 proposals received, the Project held 3 meetings (2 in 2016, and the last in early 2017) to review the proposals, resulting in 5 short-listed applicants in 2016 (3 in Odisha and one each of Madhya Pradesh and Assam). The 2017 meeting resolved to move forward with 2 of the 3

shortlisted firms from Odisha and request further information for the proposals from Madhya Pradesh and Assam. For reasons unknown to the Evaluation, this work on the concept of "entrepreneurial hubs" was eventually abandoned with the 2 selected firms in Odisha not being provided with any ACE grants and no further activity for the other two states.

85. A second phase of work to achieve Outcome 2 coincides with the recent ramp-up of work at the end of 2018 and beginning of 2019 as led by UNDP CO. At the end of 2018, Villgro was retained by UNDP to lead efforts to re-evaluate RE supply chain work. Despite producing a 26-page report with a listing of 55 suppliers (from 63 enterprises had been surveyed and 6 experts interviewed) for US$74,200, the assignment did not provide any plans for how these RE entities would be integrated to focus on deployment of RETPRL demonstrations and replications (since Villgro was not told of the ACE approach to the replication phase). Villgro, however, does have a history incubating enterprises and, potentially, could have focused on selected RETPRLs and their integration with the project demos by having suppliers working with communities to develop demo proposals. Villgro had at that time incubated Ecofrost, the supplier of the 6 five-ton solar cold storage units purchased by the Project. However, after mid-2019, no action was taken as a follow-up with this and Villgro's list of suppliers and service providers. This was likely due to the loss of the PMU staff in late 2019 including the technical officer, and possibly a realization that the MNRE-ACE subsidy model was not competitive with other ongoing schemes. As such, without the interest of MNRE, this list of suppliers and service providers did not get approved by MNRE.

86. Based on the information presented in Table 7, the results of Outcome 2 can be rated as **unsatisfactory.** A rationale for this rating is partial achievement of the target for identifying 55 RE technology supply and service providers for rural livelihood applications against a target of 100, but no delivery of any developed business plans or financial mechanisms to access finance for any RE technology supply and service providers (primarily due to no MNRE approval of any SNA proposals).

3.3.4 Component 3: Policy and regulatory support for RE-rural livelihood applications

87. Under this Component, there were 3 expected outcomes:

- Activities under Outcome 3.1 were intended to result in the "inclusion of RE applications in national and state level rural livelihoods policies for key livelihood sectors in rural areas". Project resources were to be used to generate several outputs including:
  - Output 3.1.1: National and State level rural livelihood mission statements / documents emphasising the use of RE;
  - Output 3.1.2: National and State level policies that support the use of RE for key rural livelihood sectors;
  - Output 3.1.3: Documented experiences and lessons on RE applications for rural livelihoods at suitable regional and international fora;
- Activities under Outcome 3.2 were intended to result in "future MNRE programs also cater to actions towards enhanced RE utilisation in rural livelihoods". Project resources were to be used to generate Output 3.2.1: Developed MNRE-supported programme for enhanced RE utilisation in rural livelihoods;
- Activities under Outcome 3.3 were intended to result in the "improved tariff and grid interconnection regulations for decentralised RE". Project resources were to be used to generate 2 outputs including:

Table 7: Outcome 2 achievements against targets

Intended Outcome	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating [50]
Outcome 2: Increased supply of RE technology and service providers for rural livelihood applications	No. of RE technology supply and service providers for rural livelihood applications by EoP	0	100	*55*	*Identification and shortlisting of 55 RE technology supply and service providers was carried out through a detailed survey by Villgro Innovations Foundation in March 2019. Major criteria of selection were current activities of these organizations and their future plans to continue in the RE sector. Delivery of this survey, however, was very late, in Year 4 of a 5 year project.*	4
Output 2: Business development aspects supported for 100 RE technology supply and service providers for rural livelihoods applications	No. of RE technology supply and service providers for rural livelihoods applications by EoP	0	100	*55*	*This indicator is a repeat of the Outcome indicator. Only one of these indicators is required for the PRF, preferably the output indicator. See Para 27 for suggested changes.*	4
	No. of business plans developed for RE technology supply and service providers by Year 2	0	20	*0*	*No business plan developments were initiated since MNRE did not approve any SNA proposals*	1
	No. of financial mechanism to access finance for RE technology supply and service suppliers by Year 2	0	1	*0*	*With no demonstration RETPRL applications approved by MNRE, there has been no initiation of any financial mechanism for RE technology supply and service providers*	1
Overall Rating – Component 2						**2**

[50] Ibid 41

- Output 3.3.1: Completed roadmap and workshops for supporting improved tariff structures for small scale captive and off-grid RE;
- Output 3.3.2: Developed and implemented regulatory, technical and tariff guidelines for RE based captive/decentralised systems' grid interconnection.

88. No substantial work has been done towards any of the three targeted outcomes of Component 3. The US$69,375 expended on this component was likely spent on 2015-16 workshops to raise general awareness as a first step towards influencing policy. Progress towards delivering outcomes under Component 3 are summarized on Table 8.

89. For Outcome 3.1, an RFP for "assessing national and state level rural livelihoods mission policies and recommending inclusion of RE applications in policies for key rural livelihood sectors" was prepared in November 2017, but never floated. Notwithstanding, the Project had begun work with SRLMs on the "RE for livelihoods" concept by offering SLRMs opportunities for involvement with RETPRL implementation and capacity building of beneficiary communities. By this measure, SNAs and SLRMs would have a basis for impacting and influencing policy though more work and implementation experience would have been required to generate at least strategic plans. Some stakeholders have suggested that SLRMs are the appropriate agency to dedicate more effort towards "RE for livelihoods" if they receive a mandate from MoRD. A link between MNRE and MoRD is mentioned in the ProDoc at the PSC level; however, the PSC meeting minutes do not give any indication of a deeper involvement of MoRD and their connections with SLRMs on this Project, presumably due to ACE's failure to deploy a substantial number of RETPRLs from which SLRMs can be involved.

90. No specific work has been done on Outcome 3.2 that directly resulted in "future MNRE programs also cater to actions towards enhanced RE utilisation in rural livelihoods". As of 19 October 2020, MNRE proposed a policy framework to promote decentralized renewable energy (DRE) systems for livelihood generation in rural India[51]. While intended Outcome 3.2 has been partially achieved, the framework being proposed by MNRE is "the ACE Project, Version 2.0", highlighting MNRE's recognition of "a wave of innovators and entrepreneurs who have come up with a variety of decentralised renewable energy (DRE) livelihood applications (i.e. RETPRLs), which are not only energy efficient but also economically viable in rural settings". The Ministry noted that successful pilots and business models have been demonstrated in livelihood sectors such as agriculture, agro-processing, dairy, poultry, fisheries, tailoring, all of which can be replicated in large volumes. The interventions proposed under the draft policy framework to promote DRE livelihood applications in rural areas includes:

- enabling a market-oriented framework to attract the private sector for the development and deployment of DRE livelihood applications;
- easy access to end-user finance for DRE livelihood applications through MNRE linking with financial institutions for credit facilitation for this framework;
- introduction of standards, stringent monitoring, and evaluation frameworks;
- skill development for strengthening the service infrastructure at the local level through MNRE collaborations with the Skill Council for Green Jobs, IITs promoting rural development and technology, National Institute for Rural Development, and other organizations falling under concerned ministries and departments;

[51] https://mnre.gov.in/img/documents/uploads/file_f-1603098738291.pdf

Table 8: Outcome 3 achievements against targets

Intended Outcome	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating[52]
Outcome 3.1: Inclusion of RE applications in national and state level rural livelihoods policies for key livelihood sectors in rural areas	No. of states enforcing policies on the RE applications as part of their SRLM and in line with the same policies at the national level by Year 3	0	4	0	*No progress on this outcome.*	1
Output 3.1.1: National and State level rural livelihood mission statements / documents emphasising the use of RE	No. of Ministries/ Departments that officially adopt mission statements that support RE applications for rural livelihoods by Year 3	0	4	0	*Assam SNA (AEDA) went to Jharkand (assistance from UNDP in 2018) to view solar cold storage rooms which were impressive to the extent that Assam wanted to replicate these.*	1
Output 3.1.2: National and State level policies that support the use of RE for key rural livelihood sectors	No. of livelihood sectors where RE is promoted in 3 targeted states by year 3	0	20	*1*	*Only horticulture is promoted as a livelihood sector where RE is promoted*	1
Output 3.1.3: Documented experiences and lessons on RE applications for rural livelihoods at suitable regional and international fora	No. of peer reviewed publications sharing experiences regarding RE and rural livelihoods by EoP	0	7	*0*	*No publications delivered due to no RETPRLs deployed in a timely manner to gather the necessary experiences with RETPRLs*	1
Outcome 3.2: Future MNRE programs also cater to actions towards enhanced RE utilisation in rural livelihoods	No. of MNRE programs that espouse RE applications for rural livelihoods programme by Year 3	0	1	*1*	*No MNRE programmes delivered as a result of work within this outcome. However, on 19 October 2020, MNRE proposed a framework to promote rural livelihood through distributed renewables. While the intended outcome was achieved, it highlights the importance of RETPRLs in India.*	3
Output 3.2.1: Developed MNRE-supported programme for enhanced RE utilisation in rural livelihoods	No. of replication projects implemented by MNRE in new programme using RETPRLs by EoP	0	28,500	*0*	*No MNRE-supported programme delivered.*	1

[52] Ibid 41

Intended Outcome	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating[52]
Outcome 3.3: Improved tariff and grid interconnection regulations for decentralised RE	No. of state regulatory commissions (SRCs) implement policy guidelines of improved tariff structure for decentralised RE by Year 3	0	3	*0*	*No progress on this outcome.*	1
Output 3.3.1: Completed roadmap and workshops for supporting improved tariff structures for small scale captive and off-grid RE	No. of state level workshops to implement the revised tariff structures by Year 3	0	3	*0*	*No state level workshops delivered.*	1
Output 3.3.2: Developed and implemented regulatory, technical and tariff guidelines for RE based captive/ decentralised systems' grid interconnection	No. of SRCs implement policy guidelines for captive/decentralised RE grid interconnection by year 3	0	3	*0*	*No policy guidelines delivered.*	1
Overall Rating – Component 3						**1**

- encourage innovation and research to develop efficient and cost-effective DRE livelihood applications through the private sector, technology incubation centers, bilateral and multilateral agencies, and NGOs;
- MNRE regularly updating list of DRE livelihood applications in consultation with stakeholders;
- MNRE and other ministries and state-level institutions will help develop new devices and applications for the rural economy;
- undertaking public awareness campaigns to push the adoption of DRE livelihood applications to be done through central and state government ministries and departments under their existing programs.

The draft framework suggests that SNAs with renewable energy expertise would coordinate with implementing agencies to provide technical support for DRE livelihood applications in rural areas or have these SNAs function as implementing agencies. The MNRE has invited stakeholders to submit their comments and inputs to this draft framework by 2 November 2020. This favourable outcome, however, is not be related to any work conducted by the ACE Project, other than the ACE Project design big used again (which was designed by UNDP in collaboration with MNRE during the PPG Phase).

91. No work has been done toward achieving Outcome 3.3 to "improve tariff and grid interconnection regulations for decentralised RE". There are conflicting views on the continued relevance of this intended outcome. Given expansion of grid electricity since 2015 in the 3 states, the demand for off-grid RE may decrease if specific end users are willing to pay premium prices for reliability of electricity or higher power levels. Some stakeholders mention that MNRE has an interest in developing mini-grids for productive uses. Regardless, MNRE will need to react to whatever is in demand, be it RE mini-grids as a high priority RETPRL and where other programs are not addressing RE mini-grids in a substantial way. One change to this outcome to maintain its original spirit would be to adjust the outcome to target "preferential tax and import tariff incentives for RETPRL suppliers."

92. Based on the information presented in Table 8, the rating of the results of Outcome 3 is assessed as **highly unsatisfactory**. This is in consideration that none of the targets were achieved using ACE resources.

3.3.5 Component 4: Financial support for decentralised RE - rural livelihood applications

93. Under this Component, 3 outcomes were expected:

- Activities under Outcome 4.1 were intended to result in "improved decentralised RE subsidies and support for rural livelihoods". Project resources were to be used to generate:
  - "assessed RE subsidy and support models for increased effectiveness of decentralised RE" (Output 4.1.1);
  - "improved RE subsidy and support models for increased effectiveness of decentralised RE for rural livelihoods funding" (Output 4.1.2);
- Activities under Outcome 4.2 were intended to result in "enhanced provision of financial support for decentralised RE in rural livelihood applications". Project resources were to be used to generate:
  - "implemented financial support packages for RE technology – rural livelihood applications" (Output 4.2.1);

  - "Pooled available financial resources for supporting viable livelihood business models and enhanced market linkages" (Output 4.2.2);
- Activities under Outcome 4.3 were intended to result in "improved investment risk mitigation for decentralised RE in rural livelihood applications". Project resources were to be used to generate "enhanced risk mitigation mechanisms designed and supported for RE enterprises and RE technology adopters/end-users in rural livelihoods applications" (Output 4.3.1).

Progress towards delivering these outcomes are summarized on Table 9.

94. No GEF funds have been spent towards achieving the outcomes of Component 4. Similar to Component 3, the lack of successes in deploying RETPRLs has not provided the demonstration value of RETPRLs to financial institutions. In turn, this does not instil confidence in financial stakeholders to setup and operate lending programmes that may include guarantee funds.

95. For Outcome 4.1, the Evaluation is clear that the establishment of the MNRE "RE for livelihoods" scheme of $10 million (for two fiscal years) and the OREDA analogous scheme for $700,000 is not linked to any GEF-ACE resources allocated to this Outcome that was intended to develop improved models for subsidy schemes that can be differentiated from the standard GoI subsidy schemes. Moreover, the MNRE and OREDA schemes are not "decentralized" though the setup of these schemes can be regarded as first steps towards Outcome 4.1.

96. For Outcome 4.2, enhanced provision of financial support for supporting RETPRL deployment would have likely included the consideration of grants, subsidies for interest rates, low or no interest loans, performance linked payments, import duty exemptions, amongst other mechanisms. If RETPRL demonstrations would have been successful, financial institutions may have become interested in loans as preferential financing mechanisms for RETPRLs with an accompanying guarantee mechanism that rural households would need considering their lack of collateral. However, without a critical number of RETPRLs being demonstrated, the Project did not engage with any financial institutions.

97. For Outcome 4.3, no work was done to design and implement a risk guarantee fund to support RETPRL deployment. The allocation of US$298,900 in ACE budget was to serve as the seed funds for a pilot guarantee fund for guarantees up to 80% of a total loan amount for an RETPRL installation. Movement towards this outcome would have required progress towards a decentralized RE subsidy scheme from Outcome 4.1 and an RETPRL loan programme from Outcome 4.2 to catalyse interest amongst rural households to finance an RETPRL. Assisting financial institutions in setting up a guarantee fund alongside of an RETPRL loan programme (using resources from Outcome 4.3), would lower the risk for lenders and increase their willingness to participate in RETPRL lending. Alternatively, funds that were initially targeted for the MNRE subsidy scheme could have been re-purposed as a guarantee fund to promote more economically viable approaches to "RE for livelihoods" or to achieve risk mitigation by supporting the business success of a household enterprise that uses RETPRLs.

98. Based on the information presented in Table 9, the rating of the results of Outcome 4 is assessed as **highly unsatisfactory**. This rating can be rationalized through no work being achieved on this component using ACE resources.

Table 9: Outcome 4 achievements against targets

Intended Outcome	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating[53]
Outcome 4.1: Improved decentralised RE subsidies and support for rural livelihoods	No. of developed improved overall subsidy and support models by Year 2	0	1	1	*Actual MNRE subsidy fund is not a result of ACE resources being spent nor is this subsidy scheme decentralized.*	3
Output 4.1.1: Assessed RE subsidy and support models for increased effectiveness of decentralised RE	No. of completed study on existing subsidies and supports by Year 1	0	1	0	*No studies completed.*	1
Output 4.1.2: Improved RE subsidy and support models for increased effectiveness of decentralised RE for rural livelihoods funding	No. of RE subsidy and support models for rural livelihoods available by year 1	0	3	0	*No decentralized RE subsidy and support models for increased effectiveness of decentralised RE for rural livelihoods funding*	1
Outcome 4.2: Enhanced provision of financial support for decentralised RE in rural livelihood applications	No. of financial institutions supporting RETPRL by Year 3	0	3	0	*No financial institutions involved in supporting RETPRL.*	1
Output 4.2.1: Implemented financial support packages for RE technology – rural livelihood applications	No. of household enterprises adopting RETPRLs that were funded by the established financial support packages by EOP	0	28,500	0	*No achievements for this indicator.*	1
Output 4.2.2: Pooled available financial resources for supporting viable livelihood business models and enhanced market linkages	No. of completed studies on inter-institutional linkages for finance pooling to support viable livelihood business models and enhanced market linkages covering three states and centre by Year 2	0	1	0	*No achievements for this indicator.*	1
Outcome 4.3: Improved investment risk mitigation for decentralised RE in rural livelihood applications	Number of states implement designed suitable risk guarantee/mitigation mechanisms by Year 3	0	3	0	*No work done towards this outcome.*	1
Output 4.3.1: Enhanced risk mitigation mechanisms designed and supported for RE enterprises and RE technology adopters / end-users in rural livelihoods applications	No. of completed studies on risk assessment and risk mitigation in applicable sectors by Year 3	0	1	0	*No achievements for this indicator.*	1
	No. of designed suitable risk guarantee/mitigation mechanisms by Year 3	0	1	0	*No achievements for this indicator.*	1
Overall Rating – Outcome 4						**1**

[53] Ibid 41

3.3.6 Relevance

99. The ACE Project remains **relevant** to a number of commitments, agreements and programmes including:

- the development priorities of India under their National Action Plan on Climate Change (NAPCC) that specifically refers to sector specific National Solar Mission that was launched as the Jawahar Lal Nehru National Solar Mission in 2010;
- the Paris Agreement where India has committed to an Intended Nationally Determined Contributions (INDC) target of 40% of its total electricity generation from non-fossil fuel (renewable) sources by 2030;
- India's efforts to achieve universal electrification, in particular through the Deendayal Upadhyaya Gram Jyoti Yojana or DDUGJY (replacing the predecessor RGGVY scheme in 2015) that supports the extension of electricity supply to all households in India (as detailed in Para 25);
- GEF-5 climate change mitigation focal area strategic objective CCM-3 to "Promote investment in renewable energy technologies."

100. In September 2019 at the United Nations Climate Action Summit, the Prime Minister of India announced increasing the renewable energy target to 450 GW by 2030 from 175 GW by 2022.

3.3.7 Effectiveness and Efficiency

101. The effectiveness of the ACE Project has been **unsatisfactory** due to:

- Project assistance during the 2015-18 period that was not effective in deployment of any RETPRLs after 18 months, and prior to MNRE's decision to move away from working with CLIAs and NGOs;
- the Project never having sufficient personnel in its PMU to manage the complex business relationships mostly between MNRE and the SNAs and SLRMs, but also the communities, CLIAs, RE suppliers and service providers;
- inability of the Project to provide appropriate guidance to the SNAs and SLRMs on preparing RETPRL proposals linked with the 2018 MNRE subsidy scheme;
- inability of the Project to deploy a critical mass of RETPRLs after 2018 that could be replicated and catalyse the interest of financial institutions;
- All of the Project targets not being achieved except for Output 1.1.

102. The efficiency of the ACE Project has been **highly unsatisfactory** for a range of reasons including:

- insufficient PMU assistance that slowed the pace of implementation to the point that the first RETPRLs were deployed in early 2019 (with 100% subsidy from ACE funds). This left insufficient time for the Project to observe RETPRL economic, social and environmental benefits. These benefits would have been documented by the Project for the purposes of replication that would have increased demands for decentralized financing;
- the Project was terminated within the design period of 60 months but with only 18% of its US$4.0 million budget expended with no outputs delivered (except Outputs 1.1 and 1.3);
- no co-financing raised since there were no RETPRLs deployed and no generation of RETPRL interest from MNRE and financial stakeholders.

3.3.8 Country Ownership and Drivenness

103. Important policies, programmes and strategies of the GoI that served as drivers for ACE implementation include:

- the Electricity Act 2003 as the first legislation dealing with rural electrification, mandating the Government to provide electricity to all areas including villages and hamlets, and being consistent in contributing to the GoI's strategy to reduce emissions intensity of India's GDP by 20-25% by year 2020 on a 2005 reference level;
- India's 12th FYP, to be launched in 2012 that contained a low-carbon growth strategy as one of the key pillars;
- India's Second National Communication Report (SNC) to UNFCCC in May 2012[54] that emphasized over 40% of the country's population not having energy access despite past GoI's initiatives to improve energy access through off-grid and distributed energy solutions;
- The Integrated Energy Policy 2006 (IEP) that aims to increase primary energy supply and the country's generation capacity supply by 5 to 6 times of their 2003-04 levels to sustain an 8 to 10% economic growth rate over next 25 years if it is to eradicate poverty and meet its human development goals. One of the IEP's important clauses on rural electrification states that Grama Panchayats were mandated to share the responsibility in energy conservation and promotion of non-conventional energy for rural electrification and the distribution of electricity;
- The GoI's programme for Decentralized Distributed Generation (DDG) that was expected to support supply of electricity and indirectly facilitate power requirement for rural livelihoods, mainly in agriculture for irrigation pump sets, small and medium industries, *khadi* and village industries and cold storage. These DDG investments were to be taken up under the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) in remote villages where grid connection is neither feasible nor cost effective.

104. One of the primary reasons for the lack of achievements on the ACE Project has been the lack of MNRE ownership and drivenness to the Project, notably after 2017 when MNRE made a key decision to not implement ACE with CLIAs. Strong indicators of the loss of MNRE interest in ACE include a flurry of activities driven by UNDP in late 2018 to kickstart RETPRL deployment as listed in Para 79, and the lack of any MNRE communication on ACE after early 2019. As such, country ownership and drivenness of the ACE Project can be rated as **unsatisfactory**.

3.3.9 Mainstreaming

105. Unfortunately, neither the goal and objective of ACE nor its outcomes were successfully mainstreamed with:

- the India UN Development Action Framework (UNDAF) 2013-2017[55], specifically UNDAF/CPD Outcome 6: Government, industry and other relevant stakeholders actively promote environmental sustainability and enhanced resilience of communities in the face of challenges of climate change, disaster risk and natural resource depletion", with CP Joint Output 6.1 of "SMEs and underserved communities have enhanced access and capacities to deploy clean technologies and practices for reducing GHG emission intensity";

[54] http://unfccc.int/resource/docs/natc/indnc2.pdf
[55] http://in.one.un.org/wp-content/uploads/2016/09/India_UNDAF202013-17_9Jul2012-1.pdf - see pgs 115 and 119

- the India UNDAF 2018-2022[56], specifically Outcome 5: By 2022, environmental and natural resource management is strengthened and communities have increased access to clean energy and are more resilient to climate change and disaster risks;
- the UNDP Strategic Plan 2014-17 with its emphasis on fostering supporting Sustainable Development Pathways as one of its three key focus areas, and a focus on sustainable development pathways that includes boosting the prospects of the poor for employment and livelihoods. Energy, and in this case RE, was clearly then linked to UNDP's core mandate for 2014-17. The ACE Project and its aim of increasing off-grid sources of renewable energy did not align with UNDP's specific focus on policy, legal and regulatory frameworks as well as institutional capacities to lower investment risks, broaden and deepen markets, and strengthen private- and public-sector capacities, all of which would have expanded investment, increased access to, and scaled-up sustainable clean energy at the national and sub-national levels;
- UNDP Strategic Plan, 2018-2021[57], specifically "Signature solution 5: Close the energy gap" where access to clean and affordable energy is deemed a critical enabler for sustainable development whether it be for nutrition, transport, education or economic opportunity, among others. The ACE Project failed to increase energy access, promote renewable energy and enhance energy efficiency in a manner that is inclusive and responsive to the needs of different sectors of the population, in line with the aspirations of Sustainable Development Goal 7.

3.3.10 Sustainability of Project Outcomes

106. In assessing sustainability of the ACE Project, the evaluators asked "how likely will the Project outcomes be sustained beyond Project termination?" Sustainability of these objectives was evaluated in the dimensions of financial resources, socio-political risks, institutional framework and governance, and environmental factors, using a simple ranking scheme:

- *4 = Likely (L):* negligible risks to sustainability;
- *3 = Moderately Likely (ML):* moderate risks to sustainability;
- *2 = Moderately Unlikely (MU):* significant risks to sustainability; and
- *1 = Unlikely (U):* severe risks to sustainability; and
- *U/A = unable to assess*.

Overall rating is equivalent to the lowest sustainability ranking score of the 4 dimensions. Details of sustainability ratings for the ACE Project are provided on Table 10.

107. *The overall ACE Project sustainability rating is unlikely (U).* This is primarily due to:

- The Project's failure to lower barriers to beneficiary interest in RETPRLs and their eventual deployment by not meeting its ACE targets for RETPRL deployment and household adoption of these RETPTLs;
- No RE technology and service providers that have been strengthened for a sustainable business to supply and install RETPRLs;
- No improvements in RE policies, RE programmes, and tariffs for DRE at the community level;
- No financial improvements for the purchase and installation of RETPRLs that would increase rural community access to RETPRLs.

[56] www.undp.org/documents/undaf /India - 2018-2022
[57] http://undocs.org/DP/2017/38

Table 10: Assessment of Sustainability of Outcomes

Actual Outcomes (as of October 2020) against the ACE PRF of 2015	Assessment of Sustainability	Dimensions of Sustainability
Actual Outcome 1: Deployment of only one RE-rural livelihood application package for demonstration (solar cold rooms), which is an insufficient number of RETPRLs to catalyse replication and a deployment to meet the target of 30,000 households adopting RETPRLs.	• *Financial Resources:* Financial resources were availed for RETPRLs through MNRE subsidy scheme; • *Socio-Political Risks*: Barriers to beneficiary interest in RETPRLs and eventual deployment has not been overcome through the Project's failure to deploy its target number of RETPRLs ; • *Institutional Framework and Governance:* The MNRE subsidy policy of not supporting more than 30% of the technology cost was not competitive with other available schemes and a primary reason why the MNRE subsidy scheme was not utilized; • *Environmental Factors:* No risks identified. ***Overall Rating***	4 1 1 4 **1**
Actual Outcome 2: Over 55 suppliers of RE technology and service providers for rural livelihood applications were identified but were never incubated for preparation of business plans or financed through financial mechanisms for the supply and installation of RETPRLs.	• *Financial Resources:* No financial support provided to these businesses, and hence their support of RETPRLs through MNRE is not sustainable; • *Socio-Political Risks:* Short-listed RET suppliers and service providers for rural livelihood applications did not receive technical support for business planning to sustain their business for RETPRLs; • *Institutional Framework and Governance:* No risks identified; • *Environmental Factors:* No risks identified. ***Overall Rating***	1 1 4 4 **1**
Actual Outcome 3.1: No RE applications in national and state level rural livelihoods policies for key livelihood sectors in rural areas.	• *Financial Resources:* Human resources are available for national and state livelihood policies for key livelihood sectors in rural areas; • *Socio-Political Risks:* With no demonstration RETPRLs, community acceptance of RETPRLs is unknown, and a barrier to formulation of any national and state livelihood policies for key livelihood sectors in rural areas; • *Institutional Framework and Governance:* Due to numerous changes in how ACE was implemented (including the pivoting away from NGOs), the Project did not gather any experiences on RETPRL deployment on which to base policies on national and state livelihood policies for key livelihood sectors in rural areas; • *Environmental Factors:* No risks identified. ***Overall Rating***	4 1 1 4 **1**
Actual Outcome 3.2: There is a draft MNRE framework proposed to promote decentralized renewable energy (DRE) systems for livelihood generation in rural India that acknowledges ongoing innovators and entrepreneurs (outside of ACE) who	• *Financial Resources:* The draft framework does not have funds but hopes to raise them through replications of the RETPRLs demonstrated and other actions of the draft framework as mentioned in Para 89; • *Socio-Political Risks:* The draft framework is confident with the demonstrated RETPRLs that barriers to scaling-up will be lowered if other actions of the draft framework of Para 90 are properly implemented;	2 3

Table 10: Assessment of Sustainability of Outcomes

Actual Outcomes (as of October 2020) against the ACE PRF of 2015	Assessment of Sustainability	Dimensions of Sustainability
have come up with a variety of RETPRLs which have demonstrated energy efficiency and economic viability in rural settings.	• *Institutional Framework and Governance:* MNRE have drafted a policy framework to promote decentralized renewable energy (DRE) systems for livelihood generation in rural India as of October 2020, a framework that aligns with the ACE design (mentioned in Para 90). MNRE are inviting stakeholder inputs and comments to the draft framework by 2 November 2020; • *Environmental Factors:* No risks identified. ***Overall Rating***	3 4 **2**
Actual Outcome 3.3: There is no improvement of tariff and grid interconnection regulations for decentralised RE	• *Financial Resources:* Human resources are available within state regulatory commissions to undertake improvements in policy guidelines of improved tariff structure for decentralised RE; • *Socio-Political Risks:* With no demonstration and subsequent replication RETPRLs, community acceptance of RETPRLs is unknown, and a barrier to improvements in policy guidelines of improved tariff structure for decentralised RE; • *Institutional Framework and Governance:* With no demonstration and subsequent replication RETPRLs, community acceptance of RETPRLs is unknown, and a barrier to improving tariff and grid interconnection regulations for decentralised RE; • *Environmental Factors:* No risks identified. ***Overall Rating***	4 1 1 4 **1**
Actual Outcome 4.1: There are no improved decentralised RE subsidies and support for rural livelihoods resulting from ACE activities.	• *Financial Resources:* The availability of decentralized RE subsidies was not assessed on this Project. However, there appears to be available resources from CSR foundations in partnership with financial institutions to provide subsidized RETPRLs with rural communities, though to what extent these resources are available is not known; • *Socio-Political Risks:* The MNRE subsidy policy is not competitive with other available schemes (with CSR Foundations and SNA subsidy funds) which is a direct cause of the poor subscription to the MNRE subsidy scheme (launched in August 2018) by SNAs and beneficiary communities; • *Institutional Framework and Governance:* MNRE is inflexible to changing of the 30% subsidy policy; • *Environmental Factors:* No risks identified. ***Overall Rating***	2 1 1 4 **1**
Actual Outcome 4.2: There is no enhanced provision of financial support for decentralised RE in rural livelihood applications	• *Financial Resources:* No discussions took place with financial institutes on enhanced provision of financial support for RETPRLs considering there were no successful demonstration RETPRLs on which to base enhanced financial support; • *Socio-Political Risks:* No discussions took place with financial institutes on enhanced provision of financial support for RETPRLs considering there were no successful demonstration RETPRLs on which to base enhanced financial support; • *Institutional Framework and Governance:* No risks identified;	1 1 4

Table 10: Assessment of Sustainability of Outcomes

Actual Outcomes (as of October 2020) against the ACE PRF of 2015	Assessment of Sustainability	Dimensions of Sustainability
	• *Environmental Factors:* No risks identified. ***Overall Rating***	4 **1**
Actual Outcome 4.3: There are no improvements in investment risk mitigation for decentralised RE in rural livelihood applications that resulted from ACE activities.	• *Financial Resources:* Funds are available from financial institutions. However, with no successful demonstration RETPRLs on which to base a loan program to rural households that would necessitate a guarantee fund, there is no such scheme to improve investment risk mitigation for RETPRLs in rural communities; • *Socio-Political Risks:* With no loan program of guarantee funds for rural household loans, rural households are not aware of any means to increase their access to financing for RETPRLs; • *Institutional Framework and Governance:* No risks identified; • *Environmental Factors:* No risks identified. ***Overall Rating***	2 1 4 4 **1**
	Overall Rating of Project Sustainability:	**1**

3.3.11 Impacts

108. There has been minimal impact from ACE activities over the past 5 years. One impact would be the raised awareness of the availability of RETPRL schemes where substantial subsidies could increase the access to RETs for the purposes of enhancing rural livelihoods. However, since the ACE resources were not used to deploy any RETPRLs (with the exception of the solar cold rooms), its impact on RE for rural livelihoods has been negligible. This is unfortunate since the information from the deployment of solar cold rooms has shown promise that the beneficiary rural communities have latched onto the concept of using the solar cold rooms to enhance the price of their produce. It is also unfortunate that this information has not been documented by the ACE Project for dissemination that would promote replication of solar cold room deployment. It is possible that this would be done by MNRE or by the respective SNAs under the proposed draft MNRE framework policy framework to promote decentralized renewable energy (DRE) systems for livelihood generation in rural India as mentioned in Para 90.

109. One other impact would be the awareness of the ACE Project design which has been used by MNRE for its draft policy framework to promote decentralized renewable energy (DRE) systems for livelihood generation in rural India as described in Para 90.

4. CONCLUSIONS, RECOMMENDATIONS AND LESSONS

110. The ACE Project was considered unique when it was first designed in 2012, utilizing GEF resources to facilitate stronger and innovative linkages with rural communities to bring them "renewable energy for livelihoods". The ACE Project had targets to enhance rural livelihoods with renewable energy, especially those of the majority of farmers, who are marginal land holders with less than 1 ha of land. There was much enthusiasm for the ACE Project during its Inception phase in 2015 with a project design formulated jointly by MNRE, UNDP and various other partners (including NGOs, CSR foundations and academic institutions).

111. Notwithstanding, the ACE Project failed to achieve its intended goal and objective primarily due to its failure to deliver Outcome 1, most importantly, Output 1.2 or the deployment of demonstration RETPRLs. With RETPRL demonstrations in Component 1 being so crucial towards achievement of the replications (Output 1.4) and other intended outcomes, this Evaluation paid more scrutiny to the numerous management issues encountered during the first 4 years of implementing the ACE Project including:

- the PMU never having been fully-staffed according to the ProDoc to manage complex institutional arrangements and strengthening linkages between a central government agency, MNRE with SNAs, local governments and rural communities (Para 51);
- MNRE followed their administrative procedures in 2015 and 2016 for calling for proposals from CLIAs for deployment of RETPRLs. Despite receiving good number of proposals, these were never considered for funding. Moreover, the entire process was cancelled (Para 49);
- MNRE's lack of clarity in working with CLIAs (NGOs) that started in mid-2016 lasting to mid-2017 that resulted in:
    - MNRE imposing several unexpected administrative procedures on NGOs in late 2016 to qualify for RETPRL subsidies from the ACE Project (Para 49, 1st bullet);
    - several CLIA proposals being shortlisted in mid to late 2016 that were never "officially" sanctioned for implementation under the ACE project (Para 49, 2nd bullet);
    - MNRE requesting RETPRL proposals from SNAs as early as mid-2016 and well into 2018 without proper guidance to the SNAs on the scope of the proposals including the context of technical and financial obligations of each stakeholder (Para 49, 4th bullet);
    - announcement in mid-2017 by MNRE of the MNRE subsidy scheme (which launched in August 2018) on which SNAs (not CLIAs) would prepare RETPRL proposals that would be linked to a 30% subsidy using ACE resources (Para 49, 4th bullet);
- Poor response by SNAs for proposals linked to the August 2018 MNRE subsidy scheme due to a SNAs wanting a 70-80% subsidy (which was not feasible for the RETPRLs under consideration), and the resulting reluctance of MNRE to change its 30% subsidy policy to a more competitive scheme against other CSR foundation schemes that offer subsidies where a beneficiary pays less than 10%. CSRs were able to offer better schemes due to falling solar PV prices in India from 2016 to 2018 resulting in several solar-related RETPRLs becoming more available and affordable to villagers (Para 50);
- the lack of MNRE-PMU personnel after mid-2018 to manage the ACE Project, leaving UNDP to manage the ACE project after 2018;
- deployment of 6 solar cold rooms as the first RETPRL deployment of the ACE Project driven by UNDP in early 2019, Year 4 of a 5-year project (Para 78). By the time the solar cold rooms were

operational, the ACE Project had insufficient resources and personnel to monitor the performance of these cold rooms and the benefits generated to the communities;
- MNRE not holding one PSC meeting during the duration of the ACE Project to share progress issues and solicit inputs from key ACE stakeholders (Para 49, last bullet).

112. The management issues in Para 114 also demonstrates an overall failure of MNRE to consider an alternative course for delivering demonstration RETPRLs in a timely manner after the MNRE decision for the Project to pivot away from CLIAs. The management issues and delays by MNRE in Para 111 resulted in the first RETPRL deployment in the field by Year 4 of a 5-year project that also brought ACE into a period where there were changes to RETPRL market conditions. This included substantial reductions in the price of solar PV technologies in India (in some cases up to 50% reduction of the 2019 prices from those of 2014 making solar PV more accessible and less innovative in terms of deployment), and the electrification of several rural communities (reducing demand and relevance of certain RE power generation technologies in certain places such as solar PV lighting or solar PV pumping possibly in another 5 years depending on the quality of electrification).

113. Notwithstanding the improvements in rural electrification in the 3 pilot states, the proposed draft policy framework of October 2020 (as described in Para 90) to promote decentralized renewable energy (DRE) for rural livelihoods still demonstrates that this sector of RE development is high on MNRE's agenda, especially to provide energy access to all. This draft framework also recognizes the need for a different approach for RETPRLs from the approach taken in ACE, with the draft framework mentioning deployed RETPRLs by CSR foundations and other low carbon innovators throughout India demonstrating substantial benefits to household incomes and livelihoods.

4.1 Corrective actions for the design, implementation, monitoring and evaluation of the project

114. *Action 1 (to MNRE and UNDP): To improve design of the ACE Project or similar projects that have central-state government interactions, project preparations should include more resources for project designers to include more details of the administrative actions to start the project, notably how MNRE communicates with the SNAs and delegates tasks to them. Project preparations of these types of projects may want to consider additional tasks (instead of forming them at the Inception phase) including:*

- Provision of a capacity assessment of each of the SNAs and their associated agencies (i.e. the SLRMs, SREDA, and other parallel agencies and partners, etc). The Evaluation team has not seen such assessments in the ProDoc, and notes that if there is a difference in the capacities of each of the 3 states on ACE Project, the Project could be forewarned of different and unique actions that would be required by the PMU for each state, as opposed to finding these differences during implementation, and dealing with it which would take time and effort, increase the risk of not delivering intended outcomes;
- Define project activities that formalize communications between the MNRE-PMU and SNAs. This Project during Inception decided to setup SCCs which were not staffed properly (in part due to the lack of qualified PMU staff), which consumed more time to formalize during implementation. Defining activities to formalize these communications would reduce the risk of implementation delays;

- Define the administrative details of transacting the subsidies through MNRE. The policy of the 30% subsidy cap for any MNRE funds was a surprise that needed to be dealt with during implementation, further delaying the crucial RETPRL demonstrations. If the exact means of transacting the subsidies or alternative means were identified during the PPG phase, the risk of delays in RETPRL demonstrations would have been mitigated.;
- Reduce the number of risks identified in the ACE ProDoc (in Annexure A) to realistic risks that could be identified for risks and mitigating actions. While the Evaluation acknowledges the difficulties in the identification of project implementation risks and risk assessment, the ACE Project could provide lessons on improving risk assessments for future projects. For example, an institutional risk identified in the ProDoc includes "many relevant State, Local and District level agencies do not co-operate and do not remain engaged for the project period through changes in State Governments, Ministers and bureaucrats"[46]. This risk assessment could be improved by mentioning that there could be administrative delays in making salary payments from a Central agency (MNRE) to state levels (SCC personnel) as mentioned in Para 51 on what had occurred.

4.2 Actions to follow up or reinforce initial benefits from the project

115. *Action 2 (to MNRE): Seek resources and partners to undertake RETRPL deployment through different implementation modalities*. This recommendation expounds on the October 2020 draft MNRE framework for decentralized renewable energy (DRE) for rural livelihoods that acknowledges several agencies (CSR Foundations and NGOs) have conducted several successful RETPRL pilots and business models in livelihoods such as agriculture, agro-processing, dairy, fisheries and charkas, all of which are poised for replication for the growth of DRE. Based on the October 2020 draft mentioned in Para 90, there is ongoing outreach to CSR Foundation platforms to publicize promising RETPRLs. There is ongoing work by other CSR Foundations in RETPRLs that is significant and could benefit through endorsement of CSR Foundation efforts by MNRE for the work they are doing. By exploring several options for deployment of RETPRLs, there would be an improved probability of meeting national targets and high demands for RETPRLs with rural communities. Subject to the feedback expected on the draft policy framework to promote DRE from relevant stakeholders, implementation modalities can include:

- partnering with CSR funds who are able to provide more competitive subsidy schemes (in comparison to MNRE's subsidy scheme) and improve linkages with beneficiary rural communities where a CSR foundation likely has a ground presence;
- working more closely with SNAs, paying close attention to the capacities of each SNA, and acknowledging the capacity variances of each SNA. Some of the SNA strengths may be related to extension officers who would have a more comprehensive understanding of community needs (i.e. livelihoods, RETs that can be applied, lower community technical capacity and training needs, etc.). Some of the capacity issues may be related to insufficient number of extension officers and difficulties in accessing some of the communities. Regardless, SNAs can play a significant role in RETPRL deployment;
- other donors who contribute to some of the CSR foundations, and who would be interested in RETPRL contributions if MNRE, in their draft framework, introduce standards as well as stringent M&E frameworks for specific RETPRLs;

[46] See pg 73 in ACE ProDoc

- MNRE can leverage these efforts to improve their effectiveness on their public platforms to disseminate information on the benefits (economic and environmental) on RETPRL usage with an improved M&E framework for RETPRLs as well as improved reporting.

116. *Action 3 (to MNRE): Create a semi-autonomous entity under MNRE to undertake CSR projects that are funded from CSR taxation of corporations*. A semi-autonomous entity may be able to attract qualified personnel (who understand renewable energy and rural livelihoods) who can improve the delivery of RETPRLs. This is similar to the Rural Electrification Corporation CSR Foundation under the Ministry of Power (a Navratna company) that is used as a vehicle to promote social projects using CSR taxation revenue from the Government of India.

4.3 Proposals for future directions underlining main objectives

117. *Action 4 (to UNDP): Assist MNRE in preparing strategic plan in support of their draft policy framework to promote DRE and RETPRLs that acknowledges the changing market conditions for RETRPLs in rural communities (related to decreasing solar PV prices and increased rural electrification) and what livelihoods can be enhanced through renewable energy.* The strategic plan should include:

- The role CSR foundations and NGOs are playing in the deployment of RETPRLs;
- The role of other projects such as the BEE-UNIDO-GEF project, FLCTD, which supports innovation for low carbon. Many of the innovations on this project are dealing with solar pumps and solar lighting in different applications, many with rural livelihood applications;
- The role of SNAs in promoting RETPRLs and building local technical capacities to support RETPRLs. The roles of the various SNAs throughout India are likely different considering the diversity of economic landscapes throughout India. A focus on the poorest states would be a good place to start;
- Forecasting the growth of RETPRLs in India, and determining the areas where more assistance for RETPRL deployment is required. With this information, MNRE can focus on areas of need, and improve their means of promoting RETPRLs to meet their 2030 target of Energy for All.

118. *Action 5 (to Government of India and UNDP): Strengthen future management and implementation of UNDP-GEF projects under NIM* through:

- Mandatory review by the PSC of roles and responsibilities of Implementing Agency (in this case MNRE) and the GEF agency (UNDP); and
- More active engagement of GEF OFP on oversight on project implementation, especially for projects with serious implementation issues. This oversight should ensure that serious issues do not arise during implementation, augmenting the role played by the PSC in monitoring the performance of key project personnel, and providing key advice to the PSC to improve project performance.

4.4 Best and worst practices in addressing issues relating to relevance, performance and success

119. *Practice requiring improvements: The project management units should never be understaffed.* The understaffing of the ACE Project has led to disastrous consequences in terms of its achievements. The lack of qualified staff has led to slow adaptive management with questionable decisions, and the

inability of the project to be implemented in a timely manner where RETPRLs could be efficiently deployed. The understaffing is a huge disappointment considering there are several suitable personnel in India more than capable of managing ACE and its complex arrangements. Alternative means of recruiting qualified PMU staff for more efficient RETPRL deployment within MNRE may need to be considered (see Action 3).

120. *Practice requiring improvements: Project preparations teams for GEF projects need to provide more details to project implementation arrangements and designs that can reduce the adaptive management required by implementation teams and reduce unnecessary project delays*. This lesson is aimed at the PPG team for the ACE Project which did not provide the details necessary to implement the complex institutional arrangements for the ACE Project. Had these details been available (such as conducting formalized consultations with SNAs based on their baseline capacities and details of transacting subsidies through MNRE), the risk of delays to the ACE Project would have been decreased (see Action 1).

APPENDIX A – MISSION TERMS OF REFERENCE FOR ACE PROJECT TERMINAL EVALUATION

Introduction

In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP support GEF financed projects are required to undergo a terminal evaluation upon completion of implementation. These terms of reference (TOR) sets out the expectations for a Terminal Evaluation (TE) of the Scale Up of Access to Clean Energy for Rural Productive Uses (India ACE Project) (PIMS 4605).

1. Evaluation purpose, scope and objectives

The objective of the project "Scale up of Access to Clean Energy for Rural Productive Uses (India Ace Project)" is to enhance reliable and affordable clean energy access for rural livelihoods in un-served and underserved areas and thereby reducing GHG emissions. The project activities aim to generate outcomes focussed on strengthening livelihoods, improving income generation and reduce use of fossil fuel. The project was approved during GEF 5 programming cycle with a total budget of USD 4,006,849. The implementing partner of the projects is Ministry of New and Renewable Energy.

The TE will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects.

The objectives of the evaluation are to assess the achievement of project results, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming.

In this case, however, project implementation has been very limited under all the four components of the project. Although originally designed implementation modality was changed for effective implementation of the project through support of centre government supported ACE scheme of $10 million yet there has been no progress post the scheme approval in the project.

2. Evaluation Criteria & Ratings

An assessment of project performance will be carried out, based against expectations set out in the Project Logical Framework/Results Framework, which provides performance and impact indicators for project implementation along with their corresponding means of verification. The evaluation will at a minimum cover the criteria of relevance, effectiveness, efficiency, sustainability and impact. Ratings must be provided on the following performance criteria. The completed table must be included in the evaluation executive summary.

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA& EA Execution**	***rating***
M&E design at entry		Quality of UNDP Implementation	
M&E Plan Implementation		Quality of Execution - Executing Agency	
Overall quality of M&E		Overall quality of Implementation / Execution	
3. Assessment of Outcomes	**rating**	**4. Sustainability**	**rating**
Relevance		Financial resources:	
Effectiveness		Socio-political:	
Efficiency		Institutional framework and governance:	
Overall Project Outcome Rating		Environmental :	
		Overall likelihood of sustainability:	

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluator(s) will receive assistance from the Country Office (CO) and Project Team to obtain financial data in order to complete the co-financing table below, which will be included in the terminal evaluation report.

Co-financing (type/source)	UNDP own financing (mill. US$)		Government (mill. US$)		Partner Agency (mill. US$)		Total (mill. US$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Actual	Actual
Grants								
Loans/Concessions								
• In-kind support								
• Other								
Totals								

3. Evaluation Approach and Method

An overall approach and method[47] for conducting project terminal evaluations of UNDP supported GEF financed projects has developed over time. The evaluator is expected to frame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact,** as defined and explained in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects. A set of questions covering each of these criteria have been drafted and are included with this TOR in Annex C. The evaluator is expected to amend, complete and submit this matrix as part of an evaluation inception report, and shall include it as an annex to the final report.
Considering the COVID outbreak and lockdown as well as a very limited implementation of this project evaluation will take place through virtual interviews.

Interviews will be held with the following organizations and individuals at a minimum:

[47] For additional information on methods, see the Handbook on Planning, Monitoring and Evaluating for Development Results, Chapter 7, pg. 163

1. Joint Secretory, MNRE
2. Director, MNRE
3. Scientist, MNRE
4. Director of state nodal agencies in Assam, Madhya Pradesh and Odisha
5. Directors of Rural Livelihood Missions in Assam, Madhya Pradesh and Odisha

The evaluator will review all relevant sources of information, such as the project document, project reports including Annual APR/PIR and other Reports, project budget revisions, midterm review, progress reports, GEF focal area tracking tools, project files, national strategic and legal documents, and any other material that the evaluator considers useful for this evidence-based assessment. A list of documents that the project team will provide to the evaluator for review is included in TOR Annex B of this Terms of Reference.

Methodological approaches may include the following:

- Evaluation should employ a combination of both qualitative and quantitative evaluation methods and instruments.
- **Document review of all relevant documentation.** This would include a review of inter alia
  - Project document (contribution agreement).
  - Theory of change and results framework.
  - Programme and project quality assurance reports.
  - Annual workplans.
  - Activity designs.
  - Consolidated quarterly and annual reports.
  - Results-oriented monitoring report.
  - Highlights of project board meetings.
  - Technical/financial monitoring reports.
- **Semi-structured interviews** with key stakeholders including key government counterparts, donor community members, representatives of key civil society organizations, UNCT members and implementing partners:
  - **Development of evaluation questions** around relevance, effectiveness, efficiency and sustainability and designed for different stakeholders to be interviewed.
  - Key informant and focus group discussions with men and women, beneficiaries and stakeholders.
  - All interviews should be undertaken in full confidence and anonymity. The final evaluation report should not assign specific comments to individuals.
- **Surveys and questionnaires** including participants in development programmes, UNCT members and/or surveys and questionnaires involving other stakeholders at strategic and programmatic levels.
- **Virtual meetings for** on-site validation of key tangible outputs and interventions.
- The evaluator is expected to follow a participatory and consultative approach that ensures close engagement with the evaluation managers, implementing partners and direct beneficiaries.
- **Other methods** such as outcome mapping, observational visits, group discussions, etc.
- **Data review and analysis** of monitoring and other data sources and methods.
  - Ensure maximum validity, reliability of data (quality) and promote use; the evaluation team will ensure triangulation of the various data sources.

4. Evaluation products (deliverables)

These products could include:

- **Evaluation inception report (10-15 pages).** The inception report should be carried out following and based on preliminary discussions with UNDP after the desk review, and should be produced before the evaluation starts (before any formal evaluation interviews, survey distribution or field visits) and prior to the country visit in the case of international evaluators.
- **Evaluation debriefings.** Immediately following an evaluation, UNDP may ask for a preliminary debriefing and findings.
- **Draft evaluation report (within an agreed length).**[48] The programme unit and key stakeholders in the evaluation should review the draft evaluation report and provide an amalgamated set of comments to the evaluator within an agreed period of time, addressing the content required (as agreed in the TOR and inception report) and quality criteria as outlined in these guidelines.
- **Evaluation report audit trail.** Comments and changes by the evaluator in response to the draft report should be retained by the evaluator to show how they have addressed comments.
- **Final evaluation report.**
- **Presentations to stakeholders and/or the evaluation reference group** (if requested in the TOR).
- **Evaluation brief and other knowledge products** or participation in knowledge-sharing events, if relevant.

5. Evaluation team composition and required competencies

The evaluation team will be composed of one international and one national evaluators. The consultants shall have prior experience in evaluating similar projects. Experience with GEF financed projects is an advantage. International evaluator will be designated as the team leader and will be responsible for finalizing the report. The evaluators selected should not have participated in the project preparation and/or implementation and should not have conflict of interest with project related activities.

The Team members must present the following qualifications:

- Minimum *10* years of relevant professional experience with post graduate degree in engineering/ environment/ management or related filed domain
- Knowledge of UNDP and GEF experience
- Previous experience with results-based monitoring and evaluation methodologies.
- Proven technical knowledge of solar PV system, rural livelihood and climate change and mitigation activities

6. Evaluation ethics

"This evaluation will be conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluation'. The consultant must safeguard the rights and confidentiality of information providers, interviewees and stakeholders through measures to ensure compliance with legal and other relevant codes governing collection of data and reporting on data. The consultant must also ensure security of collected information before and after the evaluation and protocols to ensure anonymity and confidentiality of sources of information where that is expected. The

[48] A length of 40 to 60 pages including executive summary is suggested.

information knowledge and data gathered in the evaluation process must also be solely used for the evaluation and not for other uses with the express authorization of UNDP and partners."

7. Implementation arrangements

The principal responsibility for managing this evaluation resides with the UNDP CO in *India*. Due to COVID pandemic and lockdown evaluation is proposed to be carried out through virtual meetings.

8. Time frame and payment schedule for the evaluation process

Preparation	*04* days (*recommended: 2-4)*	*15/7/2020*
Evaluation Mission (Virtual)	*5* days *(r: 7-15)*	*25/7/2020*
Draft Evaluation Report	*5* days *(r: 5-10)*	*5/8/2020*
Final Report	*2* days *(r: 1-2)*	*10/8/2020*

The total duration of the evaluation will be *14* days according to the following plan:

Deliverable	Content	Timing	Responsibilities	Payment
Inception Report	Evaluator provides clarifications on timing and method	No later than 2 weeks before the evaluation mission.	Evaluator submits to UNDP CO	20%
Presentation	Initial Findings	End of evaluation mission	To project management, UNDP CO	20%
Draft Final Report	Full report, (per annexed template) with annexes	Within 3 weeks of the evaluation mission	Sent to CO, reviewed by RTA, PCU, GEF OFPs	20%
Final Report[49]	Revised report	Within 1 week of receiving UNDP comments on draft	Sent to CO for uploading to UNDP ERC.	40%

The evaluation team is expected to deliver the following:

9. Application submission process and criteria for selection

Applicants are requested to apply online (indicate the site, such as http://jobs.undp.org, etc.) by (25/07/2020).

Individual consultants are invited to submit applications together with their CV for these positions. The application should contain a current and complete C.V. in English with indication of the e-mail and phone contact. Shortlisted candidates will be requested to submit a price offer indicating the total cost of the assignment (including daily fee, per diem and travel costs).

UNDP applies a fair and transparent selection process that will take into account the competencies/ skills of the applicants as well as their financial proposals. Qualified women and members of social minorities are encouraged to apply.

[49] When submitting the final evaluation report, the evaluator is required also to provide an 'audit trail', detailing how all received comments have (and have not) been addressed in the final evaluation report.

APPENDIX B – MISSION ITINERARY (FOR AUGUST-OCTOBER 2020)

#	Activity	Stakeholder involved	Place
25 August 2020 (Tuesday)			
1	Debriefing meeting with ACE team with UNDP	UNDP India	By Zoom
9 September 2020 (Wednesday)			
2	Discussion with Ms. Chitra Narayanswamy, former UNDP Project Officer during PPG Phase	UNDP India	By Zoom
10 September 2020 (Thursday)			
3	Discussion with Dr. Srinivas, former UNDP Project Officer (2015-2018)	UNDP India	By Zoom
13 September 2020 (Sunday)			
4	Discussion with Mr. Mrinal Chaudry, Assam Energy Development Agency	SNA	By Zoom
16 September 2020 (Wednesday)			
5	Discussion with Mr. Arupananda Pattanaik, Odisha Energy Development Agency	SNA	By Zoom
18 September 2020 (Friday)			
6	Discussion with Ms. Usha Rao, UNDP RTA, Bangkok	UNDP	By Zoom
28 September 2020 (Monday)			
7	Discussion with Ms. Preeti Soni, UNDP India, Cluster Leader for Energy and Environment	UNDP India	By Zoom
1 October 2020 (Thursday)			
8	Discussion with Mr. Shobhit Srivastava, MNRE	MNRE	By Zoom
18 October 2020 (Sunday)			
9	Discussion with Dr. Srinivas, former UNDP Project Officer (2015-2018)	UNDP India	By Zoom
27 October 2020 (Tuesday)			
10	Discussion with Dr. Bhawna Singh, (Scientist-D). Govt. of India, MOEF & CC	MoEFCC (GEF Focal Point)	

Total number of meetings conducted: 10

APPENDIX C – LIST OF PERSONS INTERVIEWED

This is a listing of persons contacted in India during the ACE Terminal Evaluation Period only. The Evaluator regrets any omissions to this list.

1. Ms. Usha Rao, UNDP Regional Technical Advisor for CCM, Bangkok Regional Hub;
2. Ms. Preeti Soni, Cluster Leader for Energy and Environment, UNDP India;
3. Mr. Saba Kalam, Programme Officer, UNDP India;
4. Mr. Sunil Shekher, Project Manager, Climate Change Resilience and Energy, UNDP India;
5. Dr. S. N. Srinivas, CEO, REC SCR Foundation (former UNDP India Programme Officer);
6. Mr. Shobhit Srivastava, Scientist, MNRE;
7. Ms. Chitra Narayanswamy, RE and Energy Access Analyst (former UNDP India Officer);
8. Mr. Arupananda Pattanaik, Odisha Energy Development Agency;
9. Mr. Mrinal Chaudry, Assam Energy Development Agency;
10. Ms. Eugenia Katsigris, International MTR Consultant for ACE;
11. Dr. Sanjay Mande, National MTR Consultant for ACE ;
12. Dr. Bhawna Singh, (Scientist-D). Govt. of India, MoEFCC (GEF Focal Point);
13. Mr. Subrato Paul, Consultant, MoEFCC (GEF Focal Point).

APPENDIX D – LIST OF DOCUMENTS REVIEWED

1. ACE Project Inception Plan, March 2015;
2. Project Document for ACE Project;
3. ACE Project Inception Report, October 2016;
4. ACE Project Implementation Reviews (PIRs) for 2017, 2018, 2019 and 2020;
5. ACE Project Board minutes and presentations from May 2015;
6. ACE PEC minutes from May 2015 to October 2017;
7. Project BTORs;
8. ACE Project Report on "Status of Supply and Service Providers for Powering Livelihoods using Renewable Energy in Assam, Madhya Pradesh, and Odisha" by Villgro and CEEW, April 2019;
9. ACE Project Report on "Revalidation of Renewable Energy Technology Packages and Rural Livelihood Sectors under the India ACE Project (Contract Reference: 2018/146)" by IPE Global;

APPENDIX E – COMPLETED TRACKING TOOL

Figure E-1: Screenshot of Page 1 of ACE Project Tracking Tool

Tracking Tool for Climate Change Mitigation Projects (For Terminal Evaluation)

Special Notes: reporting on lifetime emissions avoided

Lifetime direct GHG emissions avoided: Lifetime direct GHG emissions avoided are the emissions reductions attributable to the investments made **during the project's supervised implementation period**, totaled over the respective lifetime of the investments.
Lifetime direct post-project emissions avoided: Lifetime direct post-project emissions avoided are the emissions reductions attributable to the investments made outside the project's supervised implementation period, but supported by financial facilities put in place by the GEF project, totaled over the respective lifetime of the investments. These financial facilities will still be operational after the project ends, such as partial credit guarantee facilities, risk mitigation facilities, or revolving funds.
Lifetime indirect GHG emissions avoided (top-down and bottom-up): indirect emissions reductions are those attributable to the long-term outcomes of the GEF activities that remove barriers, such as capacity building, innovation, catalytic action for replication.
Please refer to the Manual for Calculating GHG Benefits of GEF Projects.

Manual for Energy Efficiency and Renewable Energy Projects
Manual for Transportation Projects

For LULUCF projects, the definitions of "lifetime direct and indirect" apply. Lifetime length is defined to be 20 years, unless a different number of years is deemed appropriate. For emission or removal factors (tonnes of CO2eq per hectare per year), use IPCC defaults or country specific factors.

General Data	Results at Terminal Evaluation	Notes
Project Title	Scale Up of Access to Clean Energy for Rural Productive Uses (India GEF ACE Project)	
GEF ID	4900	
Agency Project ID	4605	
Country	India	
Region	EAP	
GEF Agency	UNDP	
Date of Council/CEO Approval		Month DD, YYYY (e.g., May 12, 2010)
GEF Grant (US$)	4,006,849	
Date of submission of the tracking tool		Month DD, YYYY (e.g., May 12, 2010)
Is the project consistent with the priorities identified in National Communications, Technology Needs Assessment, or other Enabling Activities under the UNFCCC?	1	Yes = 1, No = 0
Is the project linked to carbon finance?	0	Yes = 1, No = 0
Cumulative cofinancing realized (US$)	19,033,767	
Cumulative additional resources mobilized (US$)	-	additional resources means beyond the cofinancing committed at CEO endorsement

Figure E-2: Screenshot of RE Page of ACE Project Tracking Tool

Objective 3: Renewable Energy		
Please specify if the project includes any of the following areas		
Heat/thermal energy production	1	Yes = 1, No = 0
On-grid electricity production	1	Yes = 1, No = 0
Off-grid electricity production	1	Yes = 1, No = 0
Policy and regulatory framework	2	0: not an objective/component 1: no policy/regulation/strategy in place 2: policy/regulation/strategy discussed and proposed 3: policy/regulation/strategy proposed but not adopted 4: policy/regulation/strategy adopted but not enforced 5: policy/regulation/strategy enforced
Establishment of financial facilities (e.g., credit lines, risk guarantees, revolving funds)	2	0: not an objective/component 1: no facility in place 2: facilities discussed and proposed 3: facilities proposed but not operationalized/funded 4: facilities operationalized/funded but have no demand 5: facilities operationalized/funded and have sufficient demand
Capacity building	2	0: not an objective/component 1: no capacity built 2: information disseminated/awareness raised 3: training delivered 4: institutional/human capacity strengthened 5: institutional/human capacity utilized and sustained
Installed capacity per technology directly resulting from the project		
Wind		MW
Biomass		MW el (for electricity production)
Biomass		MW th (for thermal energy production)
Geothermal		MW el (for electricity production)
Geothermal		MW th (for thermal energy production)
Hydro		MW
Photovoltaic (solar lighting included)	0.024	MW
Solar thermal heat (heating, water, cooling, process)		MW th (for thermal energy production, 1m² = 0.7kW)
Solar thermal power		MW el (for electricity production)
Marine power (wave, tidal, marine current, osmotic, ocean thermal)		MW
Lifetime energy production per technology directly resulting from the project (IEA unit converter: http://www.iea.org/stats/unit.asp)		
Wind		MWh
Biomass		MWh el (for electricity production)
Biomass		MWh th (for thermal energy production)
Geothermal		MWh el (for electricity production)
Geothermal		MWh th (for thermal energy production)
Hydro		MWh
Photovoltaic (solar lighting included)		MWh
Solar thermal heat (heating, water, cooling, process)	378.00	MWh th (for thermal energy production)
Solar thermal power		MWh el (for electricity production)
Marine energy (wave, tidal, marine current, osmotic, ocean thermal)		MWh
Lifetime direct GHG emissions avoided		tonnes CO2eq (see Special Notes above)
Lifetime direct post-project GHG emissions avoided		tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (bottom-up)		tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (top-down)		tonnes CO2eq (see Special Notes above)

APPENDIX F – PROJECT PLANNING MATRIX FOR ACE PROJECT (FROM 2015)

This project will contribute to achieving the following Country Programme Outcome as defined in the UNDP Strategic Plan 2014-2017 and the UNDP India CPAP 2013-2017:
Project: Scale Up of Access to Clean Energy for Rural Productive[50] Uses (India ACE Project)
Outcome: Expanded access to clean energy**.**
Output: Support for initiatives that increase access to clean energy for productive uses in off-grid, underserved rural regions.
Output indicators: number of REPTRL packages developed and trialled, number of RE for rural livelihoods applications fostered by project.

Country Programme Outcome Indicators:
Outcome: Progress towards meeting national commitments under multilateral environmental agreements
Output: Supporting national development objectives with co-benefits of mitigating climate change
***Output indicators*:** (a) Annual reductions in greenhouse gas (GHG) emissions in India; (b) million USD flowing annually to India from GEF through UNDP for this programme; (c) number of additional UNDP initiatives for achieving global and national targets under multilateral environmental agreements.

Primary applicable Key Environment and Sustainable Development Key Result Area): Strengthened national capacities to mainstream environment and energy concerns into national development plans.

Expanding access to environmental and energy services for the poor.

Applicable GEF Strategic Objective and Program:
Strategic Objective: Climate Change Objective 3: Promote investment in renewable energy technologies

Applicable GEF Expected Outcomes: Increased market uptake of RE systems for rural livelihoods

Applicable GEF Outcome Indicators:
a. Extent to which EE policies and regulations are adopted and enforced
b. Volume of investment mobilized
c. Tonnes of CO_2 equivalent avoided

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Description	Baseline	Target		
Project goal: Reduced GHG emissions achieved through renewable energy systems in rural livelihood sectors	Cumulative CO_2 emission reduced from start of project to End-Of-Project (EOP), (tCO_2e)	0	69,115	M&E reports of the demonstration and replication projects	Continued support and participation from co-financing institutions, MNRE, CLIAs and other stakeholders

[50] The original PIF and documentation referred to "and Domestic (Uses)" but in the PPG phase the feedback and analysis firmly supported a narrowing of the project scope to be limited to productive uses. In a country of over 1.2 billion people (India) even just focusing on productive uses in three states is very ambitious with only a GEF $4 million budget. Adding domestic uses would increase project implementation complexity and risks as domestic users expect low cost (subsidised) electricity supply and it would also make the project scope and ambition too great. This reduction in scope to just productive uses will also address GEF STAP and Council comments at the PIF stage of the project scope being too ambitious and that the original project was too unfocussed.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Description	Baseline	Target		
Project Objective: Enhancing reliable and affordable clean energy access for rural livelihoods in un-served and underserved areas	Total energy savings achieved from implemented RETPRLs by EOP MWhe MWh_{th}	0 0	112,737 1,376,631	M&E reports of the demonstration and replication projects	Selected end users for demos and replications have sufficient finance and favourable business environment
Component 1: Development and deployment of key RE-rural livelihood application packages					
Outcome 1: Deployment of RE-rural livelihood application packages	No. of household enterprises adopting RETPRLs through demonstrations and replications in the targeted states by the EOP	0	30,000	M&E reports of the demonstration and replication projects	Sufficient finance is available for the implementation of developed packages for RE-rural livelihood
Output 1.1: At least ten (10) cost-effective RE technology packages developed for rural livelihood (RETPRL) applications and established technical specifications	No. of RETPRLs developed by Year 2	0	10	Performance assessment reports on RETPRLs	RE technology suppliers willing to provide services as required for technology packages in rural areas
Output 1.2: Demonstrated and documented RE – rural livelihood application packages in 15 clusters and benefitting 1,500 household enterprises	No. of demonstration project clusters by EoP	0	15	Reports from CLIAs M&E reports of the demonstration	Household enterprises are convinced with RE application benefits in livelihood activities
	No. of household enterprises adopting RETPRLs in the demonstration clusters by Year 3	0	1,500	Reports from CLIAs M&E reports of the demonstration	End-users are interested and have the sufficient finance
Output 1.3: Completed training programmes and training of trainers activities for replication and scale up of RE – rural livelihood application packages	No. of training programmes conducted by EoP	0	14	Report of training programmes	Continued support and participation from co-financing institutions, MNRE, CLIAs and other stakeholders
	No. of training packages developed by Year 2	0	7	Training package material	Continued support and participation from co-financing institutions, MNRE, CLIAs and other stakeholders
	No. of persons trained by EoP	0	280	Report of training programmes	Continued support and participation from co-financing institutions, MNRE, CLIAs and other stakeholders

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Description	Baseline	Target		
Output 1.4: Completed promotion of replicated and documented RE – rural livelihood application packages promoted to other districts / states and applied to 28,500 household enterprises	No. of household enterprises adopting RETPRLS through replications by EoP	1,500 (at the end of demonstration)	30,000	M&E reports of the replication projects	Implementing agencies and end-users are interested, accept RETPRLs and are equipped to implement the project
Component 2: Supply chain for RE technology supply and service providers for enhancing rural livelihoods					
Outcome 2: Increased supply of RE technology and service providers for rural livelihood applications	No. of RE technology supply and service providers for rural livelihood applications by EoP	0	100	M&E of supply chain development activity	There is sufficient demand for RETPRLs amongst existing and new RE technology and service providers
					Enterprises have sufficient technical and financial capacity
Output 2: Business development aspects supported for 100 RE technology supply and service providers for rural livelihoods applications	No. of RE technology supply and service providers for rural livelihoods applications by EoP	0	100	M&E of supply chain development activity	
	No. of business plans developed for RE technology supply and service providers by Year 2	0	20	M&E of supply chain development activity/ business plan reports	
	No. of financial mechanism to access finance for RE technology supply and service suppliers by Year 2	0	1	M&E of supply chain development activity	
Component 3: Policy and regulatory support for RE - rural livelihood applications					
Outcome 3.1: Inclusion of RE applications in national and state level rural livelihoods policies for key livelihood sectors in rural areas	No. of states enforcing policies on the RE applications as part of their SRLM and in line with the same policies at the national level by year 3	0	4	NRLM (1) and SRLMs (3 states) policy documents	NRLM and SRLMs that support RE applications for rural livelihoods is sustained
Output 3.1.1: National and State level rural livelihood mission statements / documents emphasising the use of RE	No. of Ministries/Departments that officially adopt mission statements that support RE applications for rural livelihoods by Year 3	0	4	Policy documents of NRLM and SRLM, meeting/ workshop reports	

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Description	Baseline	Target		
Output 3.1.2: National and State level policies that support the use of RE for key rural livelihood sectors	No. of livelihood sectors where RE is promoted in 3 targeted states by year 3	0	20	Central (e.g. KVIC) and state livelihoods sectors /departments policy documents	Continued support and participation from co-financing institutions, MNRE, CLIAs and other stakeholders
Output 3.1.3: Documented experiences and lessons on RE applications for rural livelihoods at suitable regional and international fora	No. of peer reviewed publications sharing experiences regarding RE and rural livelihoods by EoP	0	7	Published reports	
Outcome 3.2: Future MNRE programs also cater to actions towards enhanced RE utilisation in rural livelihoods Output 3.2.1: Developed MNRE-supported programme for enhanced RE utilisation in rural livelihoods	No. of MNRE programs that espouse RE applications for rural livelihoods programme by Year 3 No. of replication projects implemented by MNRE in new programme using RETPRLs by EoP	0 0	1 28,500	MNRE policy document Documentation of MNRE-supported RET operated rural livelihood projects	Continued support and participation from co-financing institutions, MNRE, CLIAs and other stakeholders
Outcome 3.3: Improved tariff and grid interconnection regulations for decentralised RE	No. of state regulatory commissions (SRCs) implement policy guidelines of improved tariff structure for decentralised RE by year 3	0	3		Continued support and participation of SRCs
Output 3.3.1: Completed roadmap and workshops for supporting improved tariff structures for small scale captive and off-grid RE	No. of state level workshops to implement the revised tariff structures by Year 3	0	3	Workshop reports	Continued support and participation from co-financing institutions, MNRE, CLIAs and other stakeholders especially SRCs
Output 3.3.2: Developed and implemented regulatory, technical and tariff guidelines for RE based captive/decentralised systems' grid interconnection	No. of SRCs implement policy guidelines for captive/decentralised RE grid interconnection by year 3	0	3	National level study report	Continued support and participation from co-financing institutions, MNRE, CLIAs and other stakeholders especially SRCs, where SRCs see RE grid interconnection as an important issue.
Component 4: Financial support for decentralised RE - rural livelihood applications					

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Description	Baseline	Target		
Outcome 4.1: Improved decentralised RE subsidies and support for rural livelihoods	No. of developed improved overall subsidy and support models by Year 2	0	1	Review report	
Output 4.1.1: Assessed RE subsidy and support models for increased effectiveness of decentralised RE	No. of completed study on existing subsidies and supports by Year 1	0	1	Review report	Continued support and participation from co-financing institutions, MNRE, CLIAs and other stakeholders in subsidising and supporting decentralised RE
Output 4.1.2: Improved RE subsidy and support models for increased effectiveness of decentralised RE for rural livelihoods funding	No. of RE subsidy and support models for rural livelihoods available by year 1	0	3	Report on recommendations	
Outcome 4.2: Enhanced provision of financial support for decentralised RE in rural livelihood applications	No. of financial institutions supporting RETPRL by Year 3	0	3	Report on new financial support packages developed	Continued interest, and participation from co-financing institutions, MNRE, CLIAs and other stakeholders such as IREDA
Output 4.2.1: Implemented financial support packages for RE technology – rural livelihood applications	No. of household enterprises adopting RETPRLs that were funded by the established financial support packages by EOP	0	28,500		
Output 4.2.2: Pooled available financial resources for supporting viable livelihood business models and enhanced market linkages	No. of completed studies on inter-institutional linkages for finance pooling to support viable livelihood business models and enhanced market linkages covering three states and centre by Year 2	0	1	Study report	Institutions are willing to continuously pool their financial resources and other financing institutions continued to provide support
Outcome 4.3: Improved investment risk mitigation for decentralised RE in rural livelihood applications	Number of states implement designed suitable risk guarantee/mitigation mechanisms by Year 3	0	3	Communication by the state governments / Review report	
Output 4.3.1: Enhanced risk mitigation mechanisms designed and supported for RE enterprises and RE	No. of completed studies on risk assessment and risk mitigation in applicable sectors by Year 3	0	1	Study report	Continued interest, and participation from co-financing institutions, MNRE, CLIAs and other stakeholders such as IREDA

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Description	Baseline	Target		
technology adopters / end-users in rural livelihoods applications	No. of designed suitable risk guarantee/mitigation mechanisms by Year 3	0	1	Study report	

APPENDIX H - LIST OF CLIA AND SNA PROPOSALS[63]

Table H-1: Assam Short-Listed CLIA Demo Proposals (from 2015 RFPs)

NGO or Other Type of CLIA	Livelihood Sector	RETPRL	Number of Systems
1. BOSCO Reach Out	KVIC	Solar charkha for handloom	41
2. BOSCO Reach Out	Horticulture	Solar pumps for horticulture (80 W)	33
3. BOSCO Reach Out	Other (tea laborers)	Solar home lighting system, with ceiling fans	44
4. Green Urja Technologies & Systems (GUTS)	Weaving	Solar home lighting system	125
5. GUTS	Weaving	Solar home lighting system	125
6. Horizon	Horticulture	PV based small cold room for horticulture	3
7. Horizon	Poultry	Solar lighting and poultry incubator	200
8. Kabil	Horticulture	Solar pumps for irrigation (0.1 HP)	84
9.Kabil	Horticulture	Solar pumps for irrigation (0.1 HP)	75
10. Rural Women Upliftment Association of Assam (RWUAA)	KVIC	Solar PV lighting systems, Solar Handlooms	NA
11. Rural Women Upliftment Association of Assam (RWUAA)	KVIC	Solar charka, solar spindle charka, LED lights	NA
12. Center for Energy, IIT Guwahati	Fisheries and Dairy	Solar Aerators and Solar PV for milk chilling	2 & 1
13. Center for Energy, IIT Guwahati	Fisheries	Solar Aerators	3
14. Center for Energy, IIT Guwahati	Horticulture	Rubber drying and processing (solar and biofuel based drying)	2
15. Free Power Technology Pvt. Ltd.	Sericulture	Solar PV off-grid plant (< 1 kW)	30
16. Action for Food Production (AFPRO)	Poultry	Solar PV lighting system, ventilation for backyard poultry farm	NA
17. AFPRO	Informal Industries/ Small Businesses	Biomass briquetting	NA
18. Sampriti NGO	KVIC	Solar PV off-grid plant (1 kW, 300 W, 40 W, 24 W)	2, 25, 45 & 50
19. Sampriti NGO	KVIC	Solar PV off-grid plant (1 kW, 300 W, 40 W, 24 W)	As above
20. Dhan Foundation	Fisheries	Solar fish dryers, solar aerator	NA
21 SSRDP (Sri Sri Rural Development Program, Art of Living Foundation)	KVIC	Solar loom, lights, fan	NA
22. SSRDP	KVIC	Solar loom, lights, fan	NA
23. SSRDP	KVIC	NA	NA

[63] List submitted by PMU at MNRE, and from ACE MTR

Table H-2: Madhya Pradesh Short-Listed CLIA Demo Proposals (from 2015 RFPs)

NGO or Other Type of CLIA	Livelihood Sector	RETPRL	Number of Systems
1. BAIF Development Research Foundation	Horticulture	Solar energy based lift irrigation system (12.5 – 15 HP pumps)	1
2. BAIF	Horticulture	Solar energy based lift irrigation system (12.5 – 15 HP pumps)	1
3. Tree Policy Centre	Fisheries	Solar fish dryers, solar aerator	NA
4. Anupama Education Society	Agriculture	Biomass gasifier for grading & packaging of rice	NA
5. Anupama E.S.	KVIC	Solar home lighting systems to power looms	100
6. Centre for Advanced Research & Development	Horticulture	5 HP solar pumps	5
7. Bhopal Yuwa Paryavaran & Shikshan & Samajik Sansthan (BYPASS)	KVIC	SPV plants (7 kW) at CFC for bamboo crafts works	2
8. Society for Communications and Social Research (SCSR)	Informal Industries	Improved cook stoves	NA
9. SCSR	Informal Industries/ KVIC	Solar home lighting systems for artisans (12 W)	500
10. Sahayog Micromanagement	Dairy	Solar milk chiller	1
11. Sahayog	Dairy	Solar milk chiller	1
12. Sahayog	Dairy	Solar PV power pack for lighting and powering small equipment at milk collection centers	
13. Sahayog	Dairy	Solar PV systems for milk chilling at milk collection centers (100 W)	130
14. GUTS	Sericulture	Solar lighting system for lights and livelihood activities (100 W)	125
15. GUTS	Various - Tailoring, Bamboo products, Potters, Blacksmith, Weaving	Solar lighting system for lights and livelihood activities (100 W) with fan	125
16. Indian Grameen Services	Poultry	Solar lighting and fan	125
17. Center for Technology Development (SESS)	Horticulture	Biomass drier/ solar drier for value addition of fruits	2
18. Pushan Renewable	Poultry	Solar poultry incubator	NA
19. Pushan Renewable	Textiles/ weaving	Solar sewing machines	NA
20. Shri Krishna Gramotthan Samiti	Horticulture	Solar PV systems for small cold rooms	NA
21. Shri Krishna Gramotthan Samiti	Horticulture	Portable solar pumps for irrigation	NA

Table H-3: Odisha Short-Listed CLIA Demo Proposals (from 2015 RFPs)

NGO or Other Type of CLIA	Livelihood Sector	RETPRL	Number of Systems
1. SOURABHA	Horticulture	1 and 2 HP pumps, solar cold storage	4, 11, & 1
2. SOURABHA	Horticulture	As above	4, 13, & 1
3. SSRP, Art of Living	Horticulture	PV micro-grid, rice huller (14 kW)	1
4. SSRP, Art of Living	Horticulture	PV micro-grid, rice huller (13 kW)	1
5. Harsha Trust	Horticulture	PV farm: 3 HP pumps, 15 acre 1 kW solar fencing, solar insect trapper, DC fridge, solar lighting system	6, 1, 6, 6, & 50
6. Harsha Trust	Horticulture	As above	As above
7. DISA	Horticulture	2 HP pump, 1 HP pump, PV cold room (5 ton)	4, 10, & 1
8. DISA	Horticulture	As above	As above
9. Switch On	Dairy	Solar milk chilling, 1 HP pump, 2 HP pump	1, 4, & 4
10. Switch On	Horticulture	Solar PV cold storage	1
11. Putnam Energy	Horticulture	1 and 2 HP pumps	4 & 4
12. Putnam Energy	Poultry	Solar lighting systems and fans	8 & 2
13. Udyama	KVIC	Solar PV for lighting and powering equipment at CFC (various sizes)	240
14. Udyama	KVIC	As above	230
15. AFPRO	KVIC	Solar home lighting system (50-100W)	97
16. AFPRO	Fisheries	Solar fish drier	NA
17. PRAGATI KORATPUT And Kalinga Renewable Energy Manufacturers Pvt Ltd	Horticulture	Solar food processing units, 7 kW, 3 kW, and 1 kW	1, 1, & 1
18. PRAGATI and Kalinga, as above	Horticulture	Solar PV cold storage (7 tons)	1
19. Inter-cooperation Social Development India	KVIC	Solar based lighting and powering of handlooms in CVC center	3
20. Eesavyasa Technology Pvt. Ltd.	Fisheries	Solar aerator	NA
21. Society for Women Action Development (SWAD)	KVIC	Solar PV for lighting and powering of equipment at CVC center	120
22. SWAD	Fisheries	Solar aerator	NA
23. Society for Participatory Action and Reflection (SPAR)	Horticulture	Solar cold storage	4
24. SPAR	KVIC	Solar lighting and powering of equipment at CFC	1
25. PACT for Rural Livelihoods		3 HP DC pump, 3 HP AC pump, 5T solar cold storage, 10 T biomass cold storage, solar sprayer	3, 3, 1, 1 & 10

Table H-4: SNA Demo Proposals (from 2016 to 2018)

State/Location	Livelihood Sector	RETPRL Description	Reasons for delay or lack of approval
Odisha/ Chililika Lagoon	Fisheries	2016 proposal that called for provision of 7 different technologies, including solar street lighting, solar PV lighting for individual processing unit, solar PV boat lighting, 7 ton solar PV fish chilling unit, 200 kg solar fish chilling unit, off-grid rooftop system, and Unnat chulah. Total RETPRL cost was US$2.5 million with a 65% subsidy expected, far beyond ACE resources available	UNDP indicated that ACE could only provide 30% subsidy for the PV lighting aspects. As such, the Chilika Development Authority (CDA) sought funding elsewhere with unconfirmed reports that they were successful for the full demonstration cost.
Odisha/ various clusters	Agriculture	First proposed in 2016, with a sub-total of 980 - 0.5 Hp pumps to be supported by ACE in designated ACE clusters out (total scheme is 2,500 pumps with the remaining 1,520 pumps covered by other funds). Total cost for the 980 pumps is US$1.3 million. The 2016 proposal proposed a 65% subsidy which was reduced to 30% in a re-submitted proposal in September 2018 requesting US$390,000 in ACE subsidies. The remaining cost was to be covered 60% by the Odisha State Government, and 10% from the beneficiaries.	No response was received for the September 2018 proposal. This is likely due to other funding sourced for the 2,500 pumps with this project extended to the following fiscal year with an additional 2,500 pumps for a total of 5,000. The total subsidy for this scheme was 65% (35% from Odisha Dept. of Agriculture and 30% from Odisha Science and Technology Department).
Odisha	Artisans	Solar lighting concept submitted in September 2018	Not known
Assam	Horticulture	Submitted in August 2018 for 250 - 0.1 HP solar micro-pumps. With a pump cost of Rs 15,700, a 30% subsidy from ACE resources was proposed for a total of US$17,000, a much lower cost than some of the proposed pumping schemes in Odisha.	Not known
Assam	Dairy	Submitted in August 2018 for solar micro-pumps and power packs for dairy.	Not known
Assam	Horticulture	Submitted in August 2018 for solar cold storage for horticulture with a suggestion of 30% subsidy from MNRE/ACE and 70% contribution from beneficiary	No approved likely due to the uncompetitive proposal of 30% of the cost coming from the beneficiary whereas other schemes have the beneficiary with a much less contribution
Assam	Nature conservation	Submitted in 2019 for lighting and power packs for communities in buffer zone of nature preserves, a concept under discussion with an NGO. Though they do not require a service fee, subsidy required would be high at 70%.	Not known
Madhya Pracdesh	Textiles and sewing	Submitted in August 2018 for PV systems for sewing centers. UNDP commissioned a consultant to prepare this and other proposals for MP.	Not known

APPENDIX I - EVALUATION CONSULTANT AGREEMENT FORM

Evaluators:

- Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
- Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
- Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
- Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
- Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
- Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
- Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

Evaluation Consultant Agreement Form[64]

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: __Roland Wong_____

Name of Consultancy Organization (where relevant)**:** _____

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at *Surrey, BC, Canada* on *3 December 2020*

[64]www.unevaluation.org/unegcodeofconduct

Evaluators:

- Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
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Evaluation Consultant Agreement Form[65]

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Mr. Keshav Das

Name of Consultancy Organization (where relevant)**:** _____

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at *Kolkata, India* on *3 December 2020*

[65] www.unevaluation.org/unegcodeofconduct