

Independent Terminal Evaluation

Mini-grids based on small hydropower sources to augment rural electrification in Tanzania

UNIDO project ID: 100261

GEF Project ID: 4004



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

**UNIDO OFFICE OF EVALUATION AND INTERNAL OVERSIGHT
INDEPENDENT EVALUATION DIVISION**

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Abbreviations and acronyms

Abbreviation / Acronym	Description
CoET	The College of Engineering and Technology
DOE-VPO	Division of Environment - Vice President's Office
EACREEE	East African Centre for Renewable Energy and Energy Efficiency
EWURA	Energy and Water Utilities Regulatory Authority
FiT	Feed-in-Tariff
GEF	Global Environment Facility
GHG	Greenhouse Gas
GoT	Government of Tanzania
M&E	Monitoring and Evaluation
MEM	Ministry of Energy and Minerals
MoE	Ministry of Energy
MoU	Memorandum of Understanding
MTE	Mid-term Evaluation
MW	Megawatt
NPM/C	National Project Manager / Coordinator
PAA	Project Administrative Assistant
PMU	Project Management Unit
ProDoc	Project Document
PSC	Project Steering Committee
RE	Renewable Energy
REA	Rural Energy Authority
REB	Rural Energy Board
REF	Rural Energy Fund
SDG 7	Sustainable Development Goals on Energy
SPPA	Standardized Power Purchase Agreement

Abbreviation / Acronym	Description
SPPT	Standardized Power Purchase Tariff
TANESCO	Tanzania Electricity Company Limited
TE	Terminal Evaluation
ToC	Theory of Change-
TOR	Terms of Reference
SPP	Small Power Producers
UDSM	University of Dar es Salaam
UNCDF	United Nations Capital Development Fund
UNIDO	United Nations Industrial Development Organization
USD	United States Dollars
ZECO	Zanzibar Electricity Corporation

Glossary of evaluation-related terms

Term	Definition
Baseline	The situation, prior to an intervention, against which progress can be assessed.
Effect	Intended or unintended change directly or indirectly due to an intervention.
Effectiveness	The extent to which the development intervention's objectives were achieved or are expected to be achieved.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Impact	Positive & negative, intended & non-intended, directly & indirectly, long term effects that represent fundamental durable change in the condition of institutions, people & their environment brought about by the Project.
Indicator	Quantitative or qualitative factors that provide a means to measure the changes caused by an intervention.
Intermediate States	The transitional conditions between the Project's outcomes & impacts which must be achieved in order to deliver the intended impacts.
Lessons learned	Generalizations based on evaluation experiences that abstract from the specific circumstances to broader situations.
Logframe (logical framework approach)	Management tool drawing on results-based management principles used to facilitate the planning, implementation and evaluation of an intervention. It involves identifying strategic elements (activities, outputs, outcomes, impacts) and their causal relationships, indicators, and assumptions that may affect project success or failure. The logframe is also referred to in the report as the Project Results Framework (PRF)
Outcomes	The likely or achieved short- to medium-term behavioural or systemic effects to which the Project contributes, which help to achieve its impacts.
Outputs	The products, capital goods, and services that an intervention must deliver to achieve its outcomes.
Relevance	The extent to which an intervention's objectives are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donor's policies.
Risks	Factors, normally outside the scope of an intervention, which may affect the achievement of an intervention's objectives.
Sustainability	The continuation of benefits from an intervention, after the development assistance has been completed.
Target groups	Specific entities for whose benefit an intervention is undertaken.

Executive Summary

Project Context

In the past several years, Tanzania's electricity access rate has improved noticeably - increased from about 15% in 2010 to about 39% in 2016¹. While noticeable progress has been achieved in urban and peri-urban areas, the pace of rural electrification, currently at 7% lags substantially behind the national average. Given the importance of electricity access for reducing extreme poverty for both urban and rural populations and fostering opportunities for productive economic activities (including agriculture), scaling up access to modern forms of energy is a significant component of the Government of Tanzania (GoT)'s long-term economic growth plan.

Tanzania also possesses substantial proven technical potential for generating power using small scale hydro power particularly in highland's headwater catchments. Wide development of micro / mini hydro power had not been realized, despite its potential and available opportunities. Institutional structure to support the development of small hydropower schemes was inadequate; there was insufficient technical expertise; the cost of sourcing and importing equipment was high; and there was lacking local manufacturing capabilities/facilities.

Intervention and use of renewable energy (RE) in rural electrification is extremely important for the improvement of the prevailing poor electricity access situation. Micro / mini hydro power is especially relevant because of its multipurpose use unlike solar. Despite all the recent efforts in promotion of RE and particularly small-scale hydropower, the implementation of RE, especially micro / mini hydro power, in Tanzania faces challenges, particularly because of the high investment needed. Several barriers related to the rural energy situation in Tanzania hinder the development of rural energy solutions in general, and small-scale hydro in particular. After review of existing barriers, meetings with various stakeholder groups and discussions with government agencies, UNIDO launched "**Mini-Grids Based on Small Hydropower Sources to Augment Rural Electrification**" project in Tanzania in the Year 2012.

Project Overview

The main objective of the project was to promote micro/mini hydropower based mini grids in Tanzania to augment rural electrification, and thus to achieve a reduction of Greenhouse gases (GHG) emissions related to the use of carbon intensive energy sources in rural areas of Tanzania. The project had four key components (apart from a component related to project management) with outcomes related to each of the components.

Evaluation Objectives and Methodologies

The purpose of the evaluation was to independently assess the project to help UNIDO improve performance and results of ongoing and future programmes and projects. The evaluation had two specific objectives:

- (i) Assess the project performance in terms of relevance, effectiveness, efficiency, sustainability and progress to impact;
- (ii) Develop a series of findings, lessons and recommendations for enhancing the design of new and implementation of ongoing and future projects by UNIDO.

¹ World Bank Indicators (latest data available)

Key Evaluation Findings, Conclusions and Recommendations

Key findings and Conclusions

Some of the key conclusions from the evaluation are:

- The project **Mini-Grids Based on Small Hydropower Sources to Augment Rural Electrification** has achieved significant results even though there were some aspects of the project that could be improved.
- The project is on course to install over 4.0 MW of demonstration hydropower schemes as against the target of 3.2 MW, with an estimated GHG reduction of over 300,000 tons of CO₂ equivalent.
- UNIDO support through GEF funding has been able to galvanize other funding sources and also has been able to leverage regular Rural Energy Authority (REA) funds and others such as United Nations Capital Development Fund (UNCDF) funds.
- In some of the demonstration schemes, the revenue generated is not sufficient to cover the cost of operation of the schemes. This is due to low income levels among households, particularly in rural areas.
- Even though the government has favourable policies to support small scale hydropower, awareness regarding the FiT and grid connection requirements is limited among developers of the hydropower schemes.
- Performance of UNIDO as the implementor of the project has been found to be highly satisfactory, and those of the National counterparts satisfactory.

Key Recommendations

- REA in collaboration with Tanzania Electricity Company Limited (TANESCO) should support the demonstration projects to achieve higher utilisation rates by assisting in extending the grid to connect more households and connection to the national or local grid.
- To improve the finances of the small hydro demonstration schemes, productive uses of electricity should be promoted by the government institutions such as REA and international agencies such as UNIDO in order to generate additional revenue from day-time use, thus improving the finances and sustainability of the schemes.
- Awareness of government policy and guidelines regarding Feed-in Tariff (FiT) and grid connection requirements among potential private developers of hydropower schemes should be improved by TANESCO, Ministry of Energy and the REA.
- TANESCO should ensure that the Power Purchase Agreements (PPAs) are for longer duration to provide incentive and reduce risks to private hydropower developers.

Evaluation Ratings

Mini-Grids Based on Small Hydropower Sources to Augment Rural Electrification project undertaken by UNIDO in Tanzania has been evaluated using several evaluation criteria using UNIDO guidelines and the detailed Terms of Reference provided to the Evaluation Team. In general, the project is regarded as successful in achieving the main outputs as envisaged in the ProDoc and the associated Logframe, despite some shortcomings are highlighted in relevant places in the document later. The overall rating for the project is **Satisfactory** and the ratings for individual criteria are shown in **Error! Reference source not found.**

Table 1 Project Ratings

<u>Evaluation criteria</u>	<u>Rating</u>
Project design	Satisfactory
• Overall design	Satisfactory
• Logframe	Satisfactory
Project performance	Satisfactory
• Relevance	Highly Relevant
• Effectiveness	Highly Satisfactory
• Efficiency	Moderately Satisfactory
• Sustainability	Moderately Likely
Cross-cutting performance criteria	Moderately Satisfactory
• Gender mainstreaming	Moderately Unsatisfactory
• Monitoring and Evaluation	Satisfactory
Performance of partners	Highly Satisfactory
• UNIDO	Highly Satisfactory
• National counterparts	Satisfactory
Overall assessment	Satisfactory

1. Introduction

1.1. Project Context

In the past several years, Tanzania's electricity access rate has improved noticeably. The number of people with access to electricity has reportedly increased from about 15% in 2010 to about 39% in 2016². While noticeable progress has been achieved in urban and peri-urban areas, the pace of rural electrification, currently at 7% lags substantially behind the national average. Given the importance of electricity access for reducing extreme poverty for both urban and rural populations and fostering opportunities for productive economic activities (including agriculture), scaling up access to modern forms of energy is a significant component of the Government of Tanzania (GoT)'s long-term economic growth plan. The GoT is targeting to increase the country's overall electricity connectivity level to 50 percent by 2025 and at least to 75 percent by 2033.

Tanzania also possesses substantial proven technical potential for generating power using small scale hydro power particularly in highland's headwater catchments. As of 2016, Tanzania's total power installed capacity was 1,357.69 MW composed of hydro 566.79 MW (42%), natural gas 607 MW (45%) and liquid fuel 173.40 MW (13%). Wide development of micro / mini hydro power had not been realized, despite its potential and available opportunities. Institutional structure to support the development of small hydropower schemes was inadequate; there was insufficient technical expertise; the cost of sourcing and importing equipment was high; and there was lacking local manufacturing capabilities/facilities.

In 2015, the assessed potential of small hydropower resources (up to 10 MW) was 480 MW. Installed, grid connected, small-hydro projects contributed only about 15 MW. Most of the developed small-hydro projects are owned by private entities and are not connected to the national electricity grid. Five sites in the 300 kW–8,000 kW range are owned by Tanzania Electric Supply Company (TANESCO) Limited. Faith-based groups own more than 16 schemes, with 15 - 800 kW capacity range and an aggregate capacity of 2 MW³.

The Government has established the Rural Energy Authority (REA) with the view to promote rural energy services, to facilitate modern energy projects for rural areas and to provide technical support for the developers. In addition, the Government has also established a Rural Energy Board (REB) and a Rural Energy Fund (REF). On the regulatory side, Standardized Power Purchase Agreement (SPPA) and Standardized Power Purchase Tariff (SPPT) exist for small power producers (SPPs). SPPT is revised on annual basis by the regulatory agency, Energy and Water Utilities Regulatory Authority (EWURA).

Intervention and use of renewable energy (RE) in rural electrification is extremely important for the improvement of the prevailing poor electricity access situation. Micro / mini hydro power is especially relevant because of its multipurpose use unlike solar. Despite all the recent efforts in promotion of RE and particularly small-scale hydropower, the implementation of RE, especially micro / mini hydro power, in Tanzania faces challenges, particularly because of the high investment needed. Several barriers including lack of proper energy planning, technical capacity, high cost of import of energy equipment, inadequate awareness and information sharing, and policy and regulatory barriers hinder the development of rural energy solutions in general, and small-scale hydro in particular, in Tanzania.

² World Bank Indicators

³ Review of Power Systems Master Plan, Tanzania, 2012 (MEM 2017)

After review of existing barriers, meetings with various stakeholder groups and discussions with government agencies, UNIDO launched “**Mini-Grids Based on Small Hydropower Sources to Augment Rural Electrification**” project in Tanzania in the Year 2012.

1.2. Overview of the Project

The main objective of the project was to promote micro/mini hydropower based mini grids in Tanzania to augment rural electrification, and thus to achieve a reduction of Greenhouse gases (GHG) emissions related to the use of carbon intensive energy sources in rural areas of Tanzania.

The project had four key components (apart from a component related to project management) with outcomes related to each of the components, as shown in Table 2.

Table 2: Project Components and Outcomes

Component	Outcome
Component 1: Techno-economic feasibility studies for the identified demonstration sites	Site-specific details on potential micro / mini hydropower sites are available for further development.
Component 2: Capacity building of stakeholders in developing micro / mini hydropower based mini-grids	Investment cost of micro / mini hydropower based mini-grids reduced because of the local availability of technical experts and high-quality indigenous hydropower equipment.
Component 3: Viable business model for micro / mini hydropower based mini-grid developed	Interest in developing micro / mini hydropower projects increased among the local entrepreneurs.
Component 4: Demonstration of micro / mini hydropower plants	Technical and economic viability of micro / mini hydropower technologies demonstrated.

As part of the Component 4, UNIDO planned to support eight demonstration hydropower projects throughout Tanzania under this project, mostly through support in procurement of electro-mechanical equipment. The list of the hydropower schemes supported under this UNIDO project and their details and statuses are shown in Table 3. Further details of the operational sites can be found in Section 3.4.1.

Table 3: List of UNIDO supported projects and their status (October 2018)

Project Name	Developer	Capacity (kW)	UNIDO Support	Operation Status
Andoya small hydropower Project	Andoya Hydroelectric Power Limited	1,000	Partial support for equipment	First 500 kW unit is operational since 2015, and was operating when the Evaluators visited the site. Second 500 kW unit from CHINA is now under installation with the rest of the works. According to UNIDO, the plant will be fully operational with the full 1000 kW generation capacity.
Tandala mini hydro project	Tandala Diaconical Centre	360	Full support for equipment through direct procurement	Not yet operational, though a Letter of Interest from TANESCO has been obtained and SPPA negotiation is ongoing.
Mpando Mini hydro power Project	Imilinyi Village cooperative	320	Full support for equipment through direct procurement	Not yet installed
Lupali mini hydro power project	Benedictine Sisters Convent	353	Full support for equipment through direct procurement	Not yet installed
Kiliflora mini hydropower project	Kiliflora Company Ltd	230	Full support for equipment through direct procurement	Operational
Salala micro hydropower project	SCD-Ludilu Parish	68	Full support for equipment through direct procurement.	Operational
Madope small hydropower project	Njombe Diocese, RC Church	1,700	Direct subsidy to cover part of equipment cost	Not yet operational though construction of the civil components is ongoing at the time of writing this report. Penstock has been installed.
Ifumbo (Mbingu) Mini hydropower project	St. Franciscan Sisters of Charity	850	Generator procurement	Operational

1.3. Theory of Change

Theory of Change (ToC) is “the description of a sequence of events that is expected to lead to a particular desired outcome”, according to Rick Davies.⁴ It is a tool for planning a project with specified outcomes and goals and is prepared normally at the planning process.

According to the Global Environment Facility (GEF) Guidelines, a project’s theory of change provides a basis for evaluation of the theory and results. Given that there is no explicit ToC analysis in the ProDoc or other documents, according to the Guidelines, a ToC is developed retrospectively based on information provided in the project documents in order to describe the intervention logic of the project.

The theory of change has been developed as shown in Figure 1 to include the following:

- outputs
- intermediate states / outcomes
- intended long-term environmental impacts of the project
- project’s objectives and high-level impact
- the causal pathways for the long-term impacts

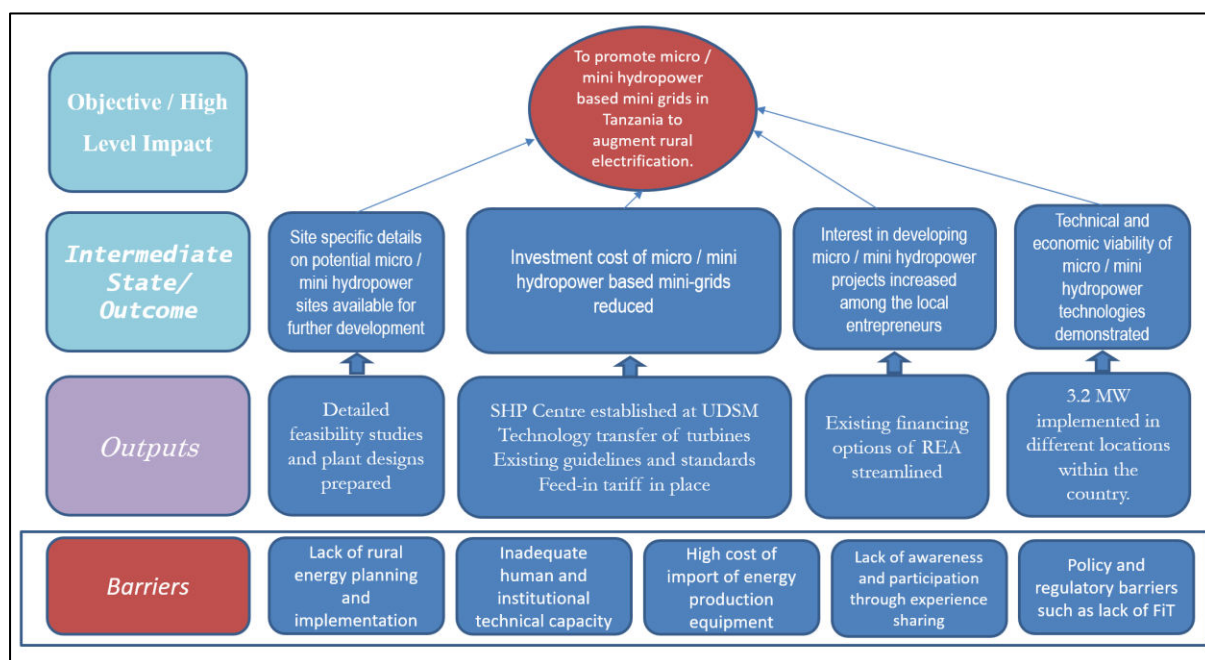


Figure 1 Theory of Change Diagram (retrospective)

Figure 1 demonstrates the causal pathways from the low-level outputs of the project (achieved within the lifetime of the project) to the higher-level objective or impact, which is described to be “to promote micro/mini hydropower based mini grids in Tanzania to augment rural electrification”. The outputs have been designed in order to overcome a number of barriers (also shown at the bottom of the ToC diagram) that has prevented the achievement of the overall Objective.

⁴ <http://mandenews.blogspot.com/2012/04/criteria-for-assessing-evaluability-of.html> - accessed 24 July 2018

There are four outputs of the project (short term results) that would lead to longer-term results (or outcomes, sometimes defined as an “intermediate state” in the ToC context). There are four outcomes defined for the project and they reasonably follow from the outputs they are based on. The ultimate higher-level objective or impact of the project thus is achieved if the outcomes are achieved. The analysis and discussions in this evaluation report follows the logic of the ToC as far as practicable.

1.4. Evaluation Objectives and Scope

The purpose of the evaluation was to independently assess the project to help UNIDO improve performance and results of ongoing and future programmes and projects. The terminal evaluation (TE) covered the whole duration of the project (2012 – 2018).

The evaluation had two specific objectives:

- (i) Assess the project performance in terms of relevance, effectiveness, efficiency, sustainability and progress to impact;
- (ii) Develop a series of findings, lessons and recommendations for enhancing the design of new and implementation of ongoing and future projects by UNIDO.

The main purpose of the terminal evaluation (TE) is to assess whether the project has achieved or is likely to achieve the project objectives. The evaluation is required to assess the project performance against several evaluation criteria such as **relevance, effectiveness, efficiency, sustainability** and **Monitoring and Evaluation (M&E)**.

The definitions of some of the key evaluation criteria assessed are given in Table 4.

Table 4: Key evaluation criteria

Criteria	Definition ⁵
Relevance	The extent to which the aid activity is suited to the priorities and policies of the target group, recipient and donor
Effectiveness	The extent to which the development intervention’s objectives were achieved, or are expected to be achieved, considering their relative importance
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results
Sustainability	The continuation of benefits from a development intervention after major development assistance has been completed. The probability of continued long-term benefits. The resilience to risk of the net benefit flows over time
Monitoring and Evaluation (M&E)	Refers to all the indicators, tools and processes used to measure if a development intervention has been implemented according to the plan (monitoring) and is having the desired result (evaluation).

1.5. Evaluation Methodology

The Evaluation Team consisted of the following experts:

- Dr Drona Upadhyay, International Evaluation Consultant and Team Leader
- Ms Elizabeth Ngoye, National Evaluation Consultant

⁵ Based on the UNIDO Evaluation Manual, 2018

The independent in-depth evaluation has utilized three main tools for the evaluation: Review of Documents, Interviews with Project Team and Stakeholders, and interviews and observations at project sites. The evaluation has followed a participatory approach integrating semi-structured interviews with stakeholders building on a desk review of project documents. The Evaluation Team used a variety of methods to ensure that data gathering and analysis delivered evidence-based qualitative and quantitative information in order to assess causality through quantitative means, but also to understand why results were achieved or not, and to triangulate information to ensure the higher reliability of the findings. Direct observation in the field was also used for triangulation and verification. Discussions with direct beneficiaries and stakeholders has been an important source of information.

The interviews have included Project Steering Committee (PSC) members, relevant staff of the Project Management Unit (PMU), GEF focal point, government officials, institutional partners, technology & service providers, benefiting individuals/households, members & representatives from beneficiary enterprises, UNIDO technical support staff in Vienna and in the field.

Other interviews, surveys or document reviews were also carried out, as/if deemed necessary by the evaluation team. A mission de-briefing was done at the end of field mission at the UNIDO office in Dar Es Salaam.

The evaluation team have largely followed the methods mentioned in the TOR for conducting the terminal evaluation, and as described above.

The evaluation team have tried to ensure that an unbiased and objective approach has been adopted and every effort has been made to validate the data through triangulation and other methods. While maintaining independence, as far as practicable, a participatory approach seeking the views of all stakeholders (listed separately in this document) have been followed for the evaluation. The field mission has been followed by conversations with project staff and counterparts in Vienna and Tanzania in order to ensure that there are no gaps in information and data.

Out of 8 hydropower demonstration schemes supported under this UNIDO project, only 4 are operational currently and others are at various stages of development, as shown in Table 3. Given that it was not possible to visit all the sites due to practical considerations, the evaluation team in consultation with PMU and UNIDO in Austria decided to visit the four operational sites based on the following reasons and criteria.

1. Operational sites will provide additional information about implementation and operation, including downstream benefits and impacts
2. These sites also cover a wide variety of ownership structures – privately owned, owned by a community and a charity
3. The schemes also represent both full and partial support from UNIDO
4. The sites also cover wide geography including central, western and northern regions of Tanzania

The list of stakeholders consulted and the project sites visited are provided in Annex 3.

An evaluation framework (evaluation matrix) (Table 5) was used as a basis to gather information for the evaluation.

Table 5:- Evaluation Framework

Questions Related to:	Lines of inquiries, verifiers, indicators	Primary Means of verification (method)	Data source and location of data collection
Project Design	Has the project been designed well including consultation with stakeholders in project planning and use of M&E	Document review, Interviews	UNIDO, Vienna and PMU, Field Mission
Project Relevance	Does the project fit the context of Tanzania?	Document Review	UNIDO, Vienna and PMU
Effectiveness	Comparison of current product quality with baseline conditions	Interviews, observation	Field Missions, UNIDO, Vienna
Efficiency	Has the money spent been worth it?	Documents (progress reports), Observation, Interviews	Field Mission, UNIDO, Vienna, PMU
Sustainability	Will the benefits of the project continue even after the support from UNIDO is ended?	Documents, Observation, Interviews	Field Mission, UNIDO, Vienna, PMU
Monitoring and Evaluation	Has the project been designed and implemented based on the sound M&E principles?	Documents and Interviews	UNIDO, Vienna and PMU, Field Mission
Monitoring of Long Term Changes	What project actions were undertaken and what has been the accomplishments towards establishing a long-term monitoring system were?	Documents and Interviews	UNIDO, Vienna and PMU, Field Mission
Assessment of Processes Affecting Achievement of Project Results	This aspect of the evaluation will deal with questions related to Country Ownership, Stakeholder Involvement and Financial Planning, among other aspects	Documents, Observation, Interviews	Field Mission, UNIDO, Vienna, PMU

A debriefing was held in UNIDO Headquarters in Vienna to present initial findings from the Terminal Evaluation.

2. Findings: Project's Effectiveness

As formulated in ProDoc, and quoted in the TOR, there are four components of the project, with each component culminating in outcomes. The section below describes the achievements of the project.

Component 1: Techno-economic feasibility studies for the identified demonstration sites

There were eight demonstration schemes planned which were supported by UNIDO under this project. Techno-economic or socio-environmental studies have been produced for the sites identified at the formulation state of the project. According to the documents available to the evaluators, these studies are carried out for the UNIDO supported projects of Kiliflora, Salala, Tandala, Madope, Lupali, Andoya (Mbangamao), Mpando and Ifumbo (Mbingu).

Component 2: Capacity building of stakeholders in developing micro / mini hydropower based mini-grids

Under the project, a number of training and capacity building activities were carried out.

One of the key trainings was the turbine manufacturing training that took place in May 2014 Bandung, Indonesia, in which nine participants from different metal manufacturing institutions in Tanzania attended, including three trainees from the SHP Centre. The participants were trained on fabrication of T-15 cross-flow turbines with capacity up to 150kW. The training also included licensing the participants rights to manufacture this type of Turbine in Tanzania. As the direct result of this training, so far six turbines have been manufactured in Tanzania for installation across sites in Tanzania (2 turbines of 5 kW each, two of 25 kW, one 1 kW and one 80kW), including one installed in Uganda. UDSM Small Hydropower (SHP) Centre was manufacturing a 75 kW turbine during the visit of the evaluators. The evaluators visited one of the sites in Arusha, (approximately 80 kW), manufactured and installed for the Arusha National Park. There were other capacity building activities carried out under this project. They are summarized in Table 6.

Table 6: Capacity Building Activities under the Project

Date	Training	Description
May 2013	Study tours for institutions and individuals to visit SHP manufacturing facilities and plants incorporating new technology outside the country	Group of four participants from College of Engineering and Technology (CoET), Rural Energy Agency (REA) and Ministry of Energy and Minerals (MEM) visited the manufacturing facilities and small hydropower plants in Austria.
February 2014	Training for water basin authorities of small hydropower development	Nine participants (2 women) from the river basin authorities participated in the training on development of small hydropower projects with particular focus on incorporating hydrological data collection, resource mapping and analysis within their water jurisdictions. The training was conducted by the SHP Centre.
September 2014	Training for practicing engineers on detailed design aspects of small hydropower	Technical training for Engineers on developing small hydropower projects - 14 participants attended from academic institutions and prospective practicing engineers.
February 2017	Operation and maintenance of small hydropower plants	This training was designed to build capacity of operators of the demonstration SHP plants in the country in order to strengthen the operators' capacity on plant management, operation and maintenance as well as make these sites sustainable.
July - September, 2017	Internship for the coordinator of Small Hydropower Centre Tanzania at International centre for Small Hydropower, Hangzhou China.	The internship program is to gain experience in operation of International Network in Small hydropower and understand operational procedures of ICSHP with eventual aim of strengthening the capacity of Small Hydropower Centre Tanzania and upgrading it as sub centre and enhance the cooperation with the EACREEE countries in developing the SHP sector.
2014-2016	Scholarships	In line with the above project objectives, as part of capacity building in Tanzania it proposed to support master's students pursuing MSc. Renewable Energy Specializing in Hydropower at University of Dar es salaam. 3 students benefitted - 2 females and 1 male

A major output of this component and of the project is the establishment of National micro / mini hydropower Technical Centre at CoET, University of Dar es Salaam (UDSM) to provide technical support for various technical institutions in Tanzania. The evaluation team visited the centre and interviewed the Centre staff regarding the activities and other aspects.

In addition, a number of students are benefiting from scholarships established under the UNIDO project to pursue higher studies.

Component 3: Viable business model for micro / mini hydropower based mini-grid developed

One of the outputs of this component of the UNIDO project is that existing financing options of REA are streamlined to benefit local entrepreneurs interested in micro / mini hydropower. REA has been very actively involved in this UNIDO project and has provided significant amount of funds to the demonstration hydro projects. REA objective is to improve rural electrification in the country, and any small hydropower scheme developed privately in remote areas are very much in line with the REA objectives and hence they should support such schemes.

Evaluators believe that various business models are being prepared by UNIDO currently and are being finalised while this report is being prepared.

Component 4: Demonstration of micro / mini hydropower plants

Four hydropower schemes are operating with the equipment procured through UNIDO support in various parts of Tanzania. There are other four hydro schemes which are under various stages of development (please refer to Table 3 for details). Generally, the schemes that are operating are delivering benefits to the local communities. The planned total installed capacity for all of the eight demonstration schemes was 3.2 MW but the project is on course to achieve approximately 4.8 MW of total power generation. The total of 4.8 MW generated will result in avoidance of direct GHG emission of around 15,140 tons of CO₂ equivalent per annum and just over 300,000 tons of CO₂ equivalent over the lifetime of the demonstration projects.

Details of the schemes are presented in section 3.4.1.

3. Findings: Project's Quality and Performance

3.1. Design

For the purpose and context of this evaluation, the Design of the project is regarded as the project description and the plan as proposed in the Project Document (ProDoc) and early phase of the project itself (including decisions made in early meetings).

The ProDoc describes the origins of the project and identifies five clear barriers that exist in the rural energy sector in the country that the project is trying to address. The barriers identified are:

1. Lack of proper rural energy planning and implementation
2. Inadequate technical capacity among human as well as institutions in the area of RE development
3. High cost of importation of energy production equipment
4. Lack of awareness and participation through experience sharing
5. Policy and regulatory barriers such as lack of Feed-in-Tariff (FiT)

The ProDoc also identifies target beneficiaries and has provided a brief overview of the policy frameworks, related to rural energy, currently in place in Tanzania.

Generally, the design of the project was found to be sufficient to address the issues identified and documented in the ProDoc. There was a strong stakeholder participation during the design phase and the project was an outcome of discussions between UNIDO and the local stakeholders in Tanzania, particularly the Ministry of Energy and Minerals (MEM) (now called Ministry of Energy, MoE after the Minerals section was split to form a separate ministry), the Rural Energy Agency (REA) and Division of Environment - Vice President's Office (DOE-VPO). This project was designed to assist, MEM through the REA in promoting renewable energy (RE) projects with special focus on Micro / mini hydropower projects in Tanzania.

The ProDoc is well written and generally describes the project in good detail. Each output has logical activities associated with it and responsibilities for each of the activity are also assigned. In addition, the timeline of the activities has been defined and appears to be realistic.

A detailed risk assessment was also carried out with mitigation measures defined.

3.1.1. Management and Project Implementation Arrangements

According to the ProDoc, UNIDO will take the responsibility of implementing the project, the delivery of the planned outputs and the achievement of the expected outcomes in collaboration with the concerned Government Ministries and private sector stakeholders. The key stakeholders such as REA and MEM had clear responsibilities assigned. As described in the ProDoc, a Project Management Unit (PMU) (with a National Project Manager or Coordinator (NPM/C) and a Project Administrative Assistant (PAA)) and was created and has been based in UNIDO offices in Dar es Salaam. The PMU function was mainly to coordinate all the project activities carried out by the national experts and other partners, including day-to-day management, and monitoring & evaluation of the project activities.

A Project Steering Committee (PSC) consisting of all the major stakeholder organisations was established, with the purpose of this committee being the review of the progress in project implementation and guiding the project strategically in line with the country needs and priorities, among other responsibilities. The project implementation arrangement has been defined well in the ProDoc, with a diagram showing the hierarchy and responsibilities, as shown in Figure 2.

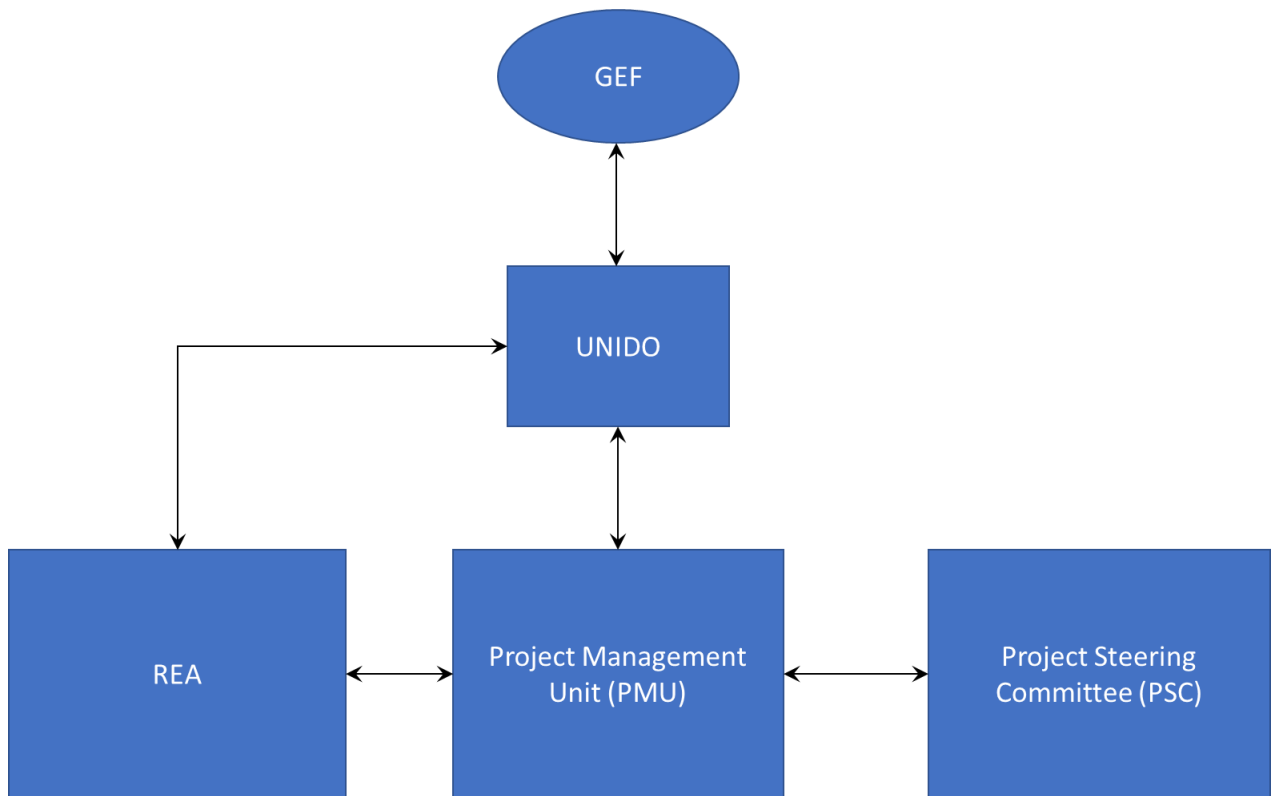


Figure 2 Project Implementation Arrangement (adapted from the ProDoc)

The main stakeholders and their responsibilities during the project implementation period have been defined well, and are shown in Table 7.

Table 7: Stakeholders and their roles in the project

Institution / Stakeholder Group	Description	Roles in the Project
Vice President's Office – Division of Environment (VPO-DoE)	According to the Website of VPO, the DoE's objective is "To provide overall policy guidance, coordination, expertise and services for sustainable environmental management and development". It also acts as the GEF Focal Point.	Chair of the Project Steering Committee (PSC)
Rural Energy Agency (REA)	Rural Energy Agency (REA) is an autonomous body under the Ministry of Energy of the United Republic of Tanzania. Its main role is to promote and facilitate improved access to modern energy services in rural areas of Mainland Tanzania. REA became operational in October 2007.	<ul style="list-style-type: none"> • Constructing various demonstration sites • Establishing the national micro / mini hydro technical centre • Streamlining financing options for micro / mini hydro projects
Ministry of Energy (MoE)	Ministry of Energy (MoE) is the umbrella ministry for the energy sector in Tanzania.	Providing additional institutional support for the recommendations on FiT for RE projects including micro / mini hydro projects.
University of Dar es Salaam (UDSM) / College of Engineering and Technology (CoET)	The College of Engineering and Technology (CoET) is a semi-autonomous campus College of the University of Dar es Salaam. It was established in 2001 through the integration and transformation of the then Faculty of Engineering (FoE) and the then Institute of Production Innovation (IPI). The CoET is "serving the industry, government, NGOs, and the wider community through a synergistic approach involving teaching and research, consultancy and services, and technology development and transfer."	<ul style="list-style-type: none"> • Providing staff support for the national micro / mini hydro technical centre • Preparing the various training materials targeting different stakeholders • Building human and institutional capacity in micro / mini hydro, by conducting suitable training
Tanzania Electric Supply Company Limited (TANESCO)	Tanzania Electric Supply Company Limited (TANESCO) is a parastatal organization under the Ministry of Energy. The Company generates, transmits, distributes and sells electricity to Tanzania Mainland and sells bulk power to the Zanzibar Electricity Corporation (ZECO) which in turn sells it to the public in islands of Unguja and Pemba. TANESCO owns most of the electricity Generating, Transmitting and Distributing facilities in Tanzania Mainland.	<ul style="list-style-type: none"> • Publishing the adapted guidelines for micro / mini hydro installation and management.

3.1.2. M & E Design

Project Document (ProDoc) provides significant attention to project Monitoring and Evaluation (M&E). A whole chapter is dedicated to describing how the M&E of the project will be undertaken.

The ProDoc provides a detailed logical framework and the M&E section of the ProDoc refers to the Logframe as the basis for the project evaluation as it provides the performance indicators for project implementation. Logical Framework describes very well the outputs and outcomes. The indicators and targets are reasonably well defined with sources of verification provided, though some sources of verification are not clear and specific enough. The ProDoc also provides clear objective for the M&E system which is “to ensure successful and quality implementation of the project.” It aims to achieve this objective by:

- i) tracking and reviewing the execution of project activities;
- ii) taking early corrective action if performance deviates significantly from the original plans and
- iii) adjusting and updating project strategy and implementation plan to reflect possible changes on the ground results achieved and the corrective actions taken.

A separate budget item for the evaluation of the project has been allocated. Based on the above analysis, the M&E Design is satisfactory.

3.2. Relevance

The project is in line with the Government of Tanzania and UNIDO priorities. National Energy Policy (2015) is the overarching policy framework for the energy sector in the country, including renewable energy.

Tanzania has rural electrification at the heart of its energy policy. REA has been created for this purpose in order to promote and facilitate improved access to modern energy services in rural areas of Mainland Tanzania. REA became operational in October 2007.

In addition, the mission statement of the Energy Policy is “to provide reliable, affordable, safe, efficient and environment friendly modern energy services to all while ensuring effective participation of Tanzanians in the sector”.

The project is also aligned to the UNIDO thematic priorities, particularly:

- Poverty reduction through productive activities
- Environment and Energy

In addition, the project is also in alignment with and will contribute towards Sustainable Development Goals on Energy (SDG 7), which aims to “ensure access to affordable, reliable, sustainable and modern energy for all”.

Based on the above discussion and analysis, the relevance of the project is Highly Satisfactory.

3.3. Efficiency

One of the key aspects in measuring the efficiency of the project is the extent to which the project was cost effective and delivered with the least costly alternative. In this context, the project was undertaken with a good degree of efficiency though the project time period was

extended twice. As the project was delayed, the activities were not in line with the original plans.

The overall budget showing the UNIDO support and the other sources of funding is shown in Table 8.

Table 8: Budget Summary for the Project Components

Project Component		Indicative Budget Estimate (US\$)		
No.	Details	GEF Funds	Co-financing	Total
1	Technical assessment and mapping of micro / mini hydropower resources in Tanzania.	200,000	650,000	850,000
2	Capacity building of relevant stakeholders in developing micro / mini hydropower based mini-grids.	700,000	700,000	1,400,000
3	Developing viable business models for micro / mini hydropower based mini-grid.	250,000	350,000	600,000
4	Demonstration of micro / mini hydropower plant based mini-grids.	1,900,000	7,378,500	9,278,500
5	Project management	300,000	700,000	1,000,000
Total		3,350,000	9,778,500	13,128,500

As shown in Table 8, GEF support (through UNIDO) had the plan to leverage more than four times the amount funded through GEF. With the total budget of just over USD 13 million, 8 hydropower schemes will be installed (four already installed and operational).

REA have supported many of the hydropower schemes under the UNIDO project through their funding pot. However, it is not confirmed how much of the co-financing that was promised had been realised.

In addition, UN Capital Development Fund (UNCDF) have also supported some of the schemes through their financing schemes. During the interviews, UNCDF indicated that their support would not have materialised if UNIDO support had not been forthcoming.

These examples show that UNIDO support through GEF funding has been able to galvanize other funding sources and also has been able to tap regular REA funds.

3.4. Sustainability

Sustainability of the UNIDO project depends overall on the three main aspects of sustainability, as described in the following sub-sections.

3.4.1. Hydropower Schemes' Sustainability

One of the outcomes of the project is "Technical and economic viability of micro / mini hydropower technologies demonstrated". In order to demonstrate the technical and

economic viability of the micro / mini hydro technology in Tanzania, the schemes supported by UNIDO should be running well technically and the schemes should be able to – at a minimum - generate adequate income to service the debts, and be able to finance all the operation and maintenance requirements.

During the evaluation mission, four operating sites were visited based on the criteria as explained earlier in the methodology section of this document, and confirmed during the inception phase through the inception report. Given that the schemes varied in sizes, ownership structure, usage and business models, the overall impressions from the four sites visited are likely to be applicable to the sites that were not operational and not visited. The following paragraph describes the aspects related to technical and economic viability, thus pointing to the sustainability aspect of the overall UNIDO project and support. Figure 3 shows the locations of the sites on a map of Tanzania.



Figure 3: Location of the visited sites under the UNIDO Project

3.4.1.1. Kiliflora Hydro Scheme

Kiliflora hydro scheme is a 230kW hydropower scheme on Usa River near Arusha and is owned and operated by the Kiliflora Ltd, a grower and supplier of Rose flowers operating on a 300-acre land – the largest rose farm in Tanzania.

UNIDO provided a financial support in the form of direct procurement of electro-mechanical equipment and Tanzania's Rural Energy Agency (REA) provided a financial support of USD 15,000 to cover part of the construction. In addition, the Fairtrade organisation provided USD 50,000 to construct a bridge and a dam as part of a multipurpose project with irrigation and water supply being other benefits accruing from the construction.

Even though the total size of the scheme is 230 kW, only about 130 kW is utilised during the day – mostly to power various equipment at the farm site of Kiliflora Ltd. A small number of households also use the electricity from the site but a proportion of power is not being utilised currently. This hydropower scheme has been very beneficial for the farm. Before the installation of the hydropower scheme, the farm used approximately 20,000 litres of diesel fuel every month. Currently, almost 100% of their power needs are provided by the hydropower scheme. This gives rise to a huge savings for the company in expenditure for fuel, as well as savings of Greenhouse Gas (GHG) emissions estimated at around 725 tons of CO₂ equivalent per year on the basis of the emission factor (EF) for diesel-based electricity generation.

There were some initial problems when the scheme was installed and operated. This was particularly a problem because the user manual provided were in Chinese language and hence it was not possible to follow any instructions to solve the problems the scheme faced. This issue would have been solved if UNIDO and project developers insisted on English language user manuals as part of the contract.

Additionally, each hydro scheme needs water rights before the scheme can be installed. According to the Kiliflora developers, Water rights is very difficult to get and it took them about a year of negotiation to obtain the water rights.

Given the assessment above, the sustainability of this scheme is very positive.

3.4.1.2. Ifumbo Hydropower Scheme

Ifumbo hydropower scheme is located close to Ifakara town in Ifumbo village in Morogoro Region. The generation capacity of the hydropower scheme is 850 kW and is developed and operated by St. Franciscan Sister of Charity. The hydropower scheme utilizes the water from Mfumbi River.

The hydropower scheme was in fact completed in 2008, well before the support was provided by UNIDO under this project. Since the installation of the project, there have been several technical problems including generator problems and the scheme had not run for much of the time until the UNIDO support in the form of the procurement of a new generator in 2016. The scheme has now been running for two years since the new generator was installed. The total cost of the scheme (in 2008) is reported to be USD 5.5 million, of which an overwhelming majority of the funding was from a Swiss donor. The hydropower scheme is providing power 24 hours a day to several institutions within the St. Franciscan Sister of Charity including St. Franciscan Sister of Charity Mbingu convent (accommodates 200 sisters), St. Judas Thaddeus Health Centre (Operating room, Ultrasound, pathology clinic), an Orphanage (54 children), a Secondary school for girls (260 girls), a Kindergarten School, Workers' Houses, a spiritual Centre and workshops (candle making and carpentry). Before the hydropower scheme, only 3 hours of electricity was provided in the night using diesel generators. The current usage of power is approximately 30 kW, according to St Franciscan Sister of Charity. This site will result in avoidance of direct GHG emission of around 2,680 tons of CO₂ equivalent per annum.

The support provided by UNIDO has been found very useful and according to an interviewee belonging to the charity, without this support they would not have achieved the current results and scheme would not be running.

Discussions with TANESCO have been initiated to supply the electricity to the wider community. There are technical issues with the scheme including an old concrete penstock which has started leaking and will require replacement relatively soon. Nominal tariff is collected from the users within the Charity though it appears that the collected fund is not sufficient to cover the operation and maintenance of the scheme.

Therefore, the sustainability of this scheme is relatively weak.

3.4.1.3. Salala Hydropower Scheme

Salala hydropower scheme is located in Ludilu Village in Njombe Region of Tanzania. The scheme is on the Salala stream near the village with a generating capacity of 68 kW. The 68 kW cross-flow hydro turbine installed was fabricated by the Tanzanian trainees in Indonesia and assembled in Tanzania. The scheme started operation from July 2017. UNIDO support, as with other hydropower schemes under this project, consisted of direct procurement of the electro-mechanical equipment. REA also provided financial support for construction work including partial funding of penstock. Power Africa provided the funds for penstock fabrication and part of the transmission and distribution network.

Currently 50 customers are benefitting from the electricity produced by the scheme. This includes households, an Orphanage (17 children – 6 girls, and 2 female caretakers), a carpentry shop, a tailoring training college, an agro-processing enterprise and a welding machine. Currently, not all power generated is being utilised, though there are a number of potential customers nearby.

In addition, the current revenue generated by the project is not sufficient to cover the current operational costs of the plan. This is due to low income and inability of the local households to pay a higher tariff. This suggests that the financial sustainability of this scheme is relatively weak, though it could improve if efforts are made to improve the utilisation of the power generated by the scheme. It will be beneficial to improve the utilisation by promoting more productive uses of electricity as the local households, even if more are connected, are unlikely to be using a significant amount of electricity during the day due to poverty as they cannot afford appliances that can be used during the day.

This site will result in avoidance of direct GHG emission of around 214 tons of CO₂ equivalent per annum.

3.4.1.4. Mbangamao Hydropower Scheme

The Mbangamao site is located at Mbangamao Village, Mbinga District, Ruvuma Region in Southern part of Tanzania. The project utilizes Mtandasi River in Mbangamao village, Mbinga District, Ruvuma region and the project site is located 14 kilometres from Mbinga Township. The site developer is Andoya Hydroelectric Power Limited (AHEPO) which is a family owned business.

The site's planned electricity generation capacity is 1 MW but currently only 0.5 MW is being generated since December 2015. According to the latest status update from UNIDO, the equipment installation and civil works have been completed and the commissioning of the scheme is 90% complete. When operating at full capacity, this site will result in avoidance of direct GHG emission of around 3,150 tons of CO₂ equivalent per annum.

Partners to the developer to date is only UNIDO with partial financial support (USD 500,000) for electromechanical equipment purchase. Project beneficiaries are 3 villages of Lifakara, Kilimani and Mbangamao.

However, at least 85% of the generation capacity is being sold to TANESCO which currently runs two diesel generators and supplies power to the whole district of Mbinga as the national grid has not reached this district.

This project was developed with the help of UNIDO but has a very strong commitment from the Andoya family. The scheme also benefitted from a zero-interest loan from UNCDF. Currently, majority of the electricity produced is being sold to TANESCO under an agreement that needs to be renewed every year, including the price that TANESCO pays to AHEPO. Short term contracts like these are unlikely to provide incentives to potential developers as it will be perceived as a risky business as TANESCO can potentially reduce the tariff it pays to unsustainable levels for the power producer.

Given the assessment above and with continued agreement with TANESCO, the sustainability of the project is positive.

3.4.2. Sustainability of Policy Framework

In any country for small scale renewable energy projects to succeed, there needs to be a favourable policy framework that provides incentives to small scale off grid renewable energy projects, including hydropower schemes. Tanzania has reasonable policy frameworks in place to support small scale renewable energy systems. Feed-in-Tariff (FiT) are in place and schemes like Mbangamao are already using this facility and selling the electricity to TANESCO.

REA is supportive of development of small-scale hydro power schemes in remote and rural areas. This is proven by the fact that many of the demonstration schemes have received cash and in-kind support from REA.

Even though there are favourable policies in place currently, entrepreneurs and developers of hydropower schemes have experienced hurdles in accessing government support and connection to TANESCO grid has not always been easy, though it should be clarified that one scheme, as explained above, have connected to TANESCO and did not face any major hurdles in the connection process. Therefore, other reasons such as lack of prior information about the connection procedures are some of the reasons that can be attributed to difficulties in grid connection. Grid connection and being able to sell any surplus energy is critical for sustainability and replication of small-scale renewable energy projects in Tanzania.

Additionally, awareness regarding the FiT and grid connection requirements is limited among developers of the hydropower schemes.

3.4.3. Sustainability of Technical Support

In order to achieve the goal and objective of the project, the mini and micro hydropower schemes should be operating without any major issues for a significant period of time so that it has the desired demonstration effect. However, in order for this to happen, technical support structure such as local manufacture, training and repair and maintenance facilities need to be in place.

UNIDO has provided support to create a small hydropower centre, as part of one of the outputs of the project. The Small Hydropower Centre (SHP Centre) has been created and hosted within the College of Engineering & Technology (CoET) at the University of Dar es Salaam. The SHP Centre is expected to act as a one-stop-shop for all technical support matters related to small hydropower such as capacity building, technical assistance in project development, identification of financial options and information dissemination activities. The SHP Centre is currently coordinated by CoET with initial support in setting up being provided from UNIDO through the GEF funds. UNIDO has supported by training the personnel to work in the SHP Centre as well as providing some tools and computer

software. A coordinator has been appointed by the College to manage daily activities of the Centre. The Centre uses the CoET and University personnel as and when necessary beyond the Coordinator's activities.

The SHP Centre was one of the beneficiaries of the training on Crossflow turbine manufacturing held in Indonesia as part of this project. Since receiving the training, the Centre has fabricated four crossflow turbines (2 of 5kW each and the other two of 25 kW each), while one 75 kW turbine was being manufactured at the time of the evaluators' visit. Two hydropower schemes using the crossflow turbines fabricated by the Centre are currently operating.

The SHP Centre has conducted trainings for hydropower developers and have carried out a pre-feasibility study for a hydropower scheme. Therefore, Small Hydropower Centre is a key establishment for continuation of technical support after the end of UNIDO project.

UNIDO support to the SHP Centre has now ended with the end of the project. Sustainability of this Centre, in order for the support it has been providing to continue, is important for the long-term sustainability of project outcome.

The Centre has prepared a five-year strategic plan for its financial sustainability. As part of the strategy, the Centre is taking steps in becoming self-sufficient by offering its services to national and international clients. One point to note in this context is that the Centre has exported a turbine to Uganda. The SHP Centre is also collaborating with the East African Centre for Renewable Energy and Energy Efficiency (EACREEE) in order to undertake regional training in collaboration with EACREEE, and the two parties have signed a Memorandum of Understanding (MoU) for collaboration in capacity building and related activities.

UNIDO project has supported a small workshop in Arusha area which has been trained in manufacture of cross flow turbines. This workshop is now producing turbines for installation in surrounding areas. One of the turbines has been installed at Arusha National Park.

It should be noted that there are still some hurdles for small scale hydro developers in Tanzania in terms of access to finance, awareness and technical knowhow in order for the sector to grow. This will mean that the organisations such as the SHP Centre and the turbine manufacturing workshop may not be able to have sufficient level of activities to keep them financially sustainable.

Based on the above, the overall Sustainability of the project outcomes appears Moderately Likely.

3.5. Gender Mainstreaming

The UNIDO Policy on gender equality and the empowerment of women and its addendum, issued respectively in April 2009 and May 2010 (UNIDO/DGB(M).110 and UNIDO/DGB(M).110/Add.1), provides the overall guidelines for establishing a gender mainstreaming strategy and action plans to guide the process of addressing gender issues in the Organization's industrial development interventions. The evaluators have referred to the above guidelines and assessed the gender mainstreaming during the planning and implementation of the project. UNIDO has recently (2015) produced a document called "Guide on Gender Mainstreaming Energy and Climate Change Projects" and the evaluation team has also consulted this document in the evaluation process.

ProDoc, which is the key document that is used to evaluate the design of the project, does not consider gender mainstreaming while designing this UNIDO supported project. There is no mention of how gender issues will be addressed while implementing this project.

Given that the ProDoc was prepared in June 2011, the ProDoc can only be assessed against the guidelines published before this time period. However, the activities carried out

during the project could be assessed according to the guidelines published during the project execution.

The ProDoc does not explicitly consider gender mainstreaming in the project design. It is however the evaluators view that gender mainstreaming can only be applied to projects in varying degrees, depending on the nature of the project and the location. Projects in Sub-Saharan Africa, where gender mainstreaming is not generally advanced in the society as a whole and not applied in practice in many development projects, should be assessed against gender mainstreaming guidelines with this context.

The evaluators found several instances of this UNIDO project attempting to address gender in activities it carried out during the project.

Project monitoring and data analysis includes collection and analysis of gender disaggregated data to some extent. UNIDO during the data collection showing impact have devised a method to disaggregate beneficiary data by gender. The impact data collection has not yet completed and hence a full analysis cannot be carried out until this data is available. However, regarding the benefits accrued from the project, it is clear that women and children have benefitted from the hydropower projects. Without electricity, women are normally responsible for manual agro-processing and cooking in the dark. With the availability of electricity and mechanised agro-processing, burden on women have been reduced. Children can also study in the night due to electricity available.

3.6. Mid Term Evaluation

A mid-term evaluation (MTE) was carried out between a period of December 2014 to February 2015, which culminated in a number of recommendations.

The evaluation team sought to assess to what extent the recommendations provided by the MTE were implemented by the respective organisations and individuals. Table 9 shows the list of recommendations and any action taken in response.

Table 9: Mid Term Evaluation Recommendations and Actions Taken

MTE Recommendations	Actions Taken / Remarks
PMU should include gender mainstreaming as part of the reporting for specific project (example mentioning that out of three Master Students receiving a scholarship from this project two are women)	Gender disaggregated data has now been included in recent reports.
PMU and UNIDO, Center for Small Hydropower Centre in Tanzania at CoET UDSM, Tanzania Bureau of Standards, REA and TANESCO should prepare a feasible and sustainable business model for investments in small hydropower projects. REA should take the lead in setting the criteria for any detailed small hydropower investment for <10 MW in terms of security of installation based on best International practices (Example Alternate Hydro Center at IIT Roorkee, India).	Small Hydropower Centre at UDSM has compiled a list of potential SHP sites in the country and showcased it to potential investors/stakeholders for development. In addition, UNIDO is compiling the business model used in developing their currently operational sites.

MTE Recommendations	Actions Taken / Remarks
<p>UNIDO procurement should facilitate the improvement of communication between supplier and investor, i.e. specifications for supplied equipment should be sent in advance of starting the projects, so that investors can prepare the construction works on time. Optimal will be that these specifications must be a requirement of the ToR with the supplier.</p>	<p>UNIDO Procurement department links the equipment supplier and the investor once the contract has been concluded. Procurement issues. Some beneficiaries are not able to secure funds in time to start the civil works, which is to be funded from their own sources as UNIDO only provide support with procurement of electro-mechanical equipment.</p>
<p>UNIDO should implement shorter lead time from GEF CEO endorsement to actual start of project implementation or project inception phase as a request from the Government of Tanzania.</p>	<p>According to UNIDO, it has managed to reduce the lead time in starting GEF projects after approval. One example is that the GEF-6 project in Tanzania was approved at the end of October 2017 and the project was launched January 2018. However, there are occasional bureaucratic hurdles in government departments that can slow down the project implementation.</p>
<p>UNIDO and PMU should introduce a detailed monitoring plan for tracking and reporting on project time-bound milestones and accomplishments, which will be updated periodically.</p>	<p>A monitoring and reporting template has been developed to be filled by the NPC on a monthly basis. Monthly monitoring reports are being completed.</p>
<p>UNIDO and PMU should introduce a system for the demonstration project partners to share the periodical progress reports that they are obliged to submit to EWURA.</p>	<p>UNIDO has an open data platform where all its member states can access relevant data/information being implemented in their countries (https://open.unido.org/). It is not clear how the demonstration project partners can upload information to this platform.</p>
<p>The Government of Tanzania (EWURA, MEM and REA) should carry-out raising of wider public awareness programs for the new Feed-In-Tariff for Renewable Energy after its completion and passing.</p>	<p>Even though not directly developed as a result of the UNIDO project, MoE and REA among others have developed a comprehensive portal to provide information on mini grids. (http://minigrids.go.tz/)</p>
<p>The Center for Small Hydropower at CoET UDSM should seek support from REA and other sources post project duration, in case additional funding in order to secure its sustainability is needed.</p>	<p>SHP Centre has produced a five-year strategic plan for its sustainability. It is also seeking to formalize its collaboration with East African Centre for Renewable Energy and Energy Efficiency (EACREEE) to undertake capacity building funded through EACREEE, having recently signed a memorandum of understanding.</p>
<p>REA, with support from UNIDO should prepare a small communication kit in form of a video and/or mini brochure for demonstrating the effects of mini</p>	

MTE Recommendations	Actions Taken / Remarks
hydro power as RE sources for direct poverty reduction through rural electrification and productive uses in the rural areas of Tanzania.	
The East African Centre for Renewable Energy and Energy Efficiency (EACREEE) and the Center for Small Hydropower in Tanzania at CoET UDSM should collaborate together once EACREEE has been established in order to facilitate regional acting of the Center, in order to use the expertise of the Tanzanian Center in Small Hydro Power. It is recommended to formalize their relationship in form of MoU or similar.	See above.

3.7. Monitoring & Evaluation Implementation

Discussion on Monitoring and Evaluation (M&E) at the design phase of the project is discussed in Chapter 3.1.2. This section is mainly dedicated to M&E during the implementation of the project.

As the main implementing agency, UNIDO was responsible for the M&E of the activities and outputs during the execution of the project. Project Management Unit (PMU) was the main responsible unit within UNIDO to monitor the progress of the project, and produce regular monitoring reports. As part of the regular monitoring, regular reports including monthly and annual reports were produced and copies of these reports have been provided to the Evaluation team. The reports were found to be sufficient to describe the latest status of the project and were a useful tool for monitoring the progress.

A number of visits to demonstration project sites were carried out by the Project Manager in Vienna and the NPC based in Dar es Salaam.

Annual Project Implementation Reports (PIR) were prepared with each report accompanied by a number of annexes related to the project outputs. The PIRs followed the logical framework and progress were reported by components and outcomes categories. Ratings were also provided for the progress, along the similar lines to the ratings used in this Evaluation report.

4. Performance of Partners

The evaluation, apart from dealing with standard assessment against criteria such as relevance, efficiency, effectiveness, and sustainability, the ToR requires evaluation of performance of the project partners.

The following chapters provide the assessment of the performance of the project partners in the implementation of the project.

4.1. UNIDO

UNIDO acted as the GEF implementing agency for this project and had the main responsibility of implementing the project, including the delivery of the activities and outputs. UNIDO also was expected to administer and manage and allocate the funds of the project on behalf of the GEF Secretariat.

Based on the literature review and on-field observation and interviews, UNIDO fulfilled its responsibility as defined in the project document reasonably well. As described elsewhere in this document, the project has achieved most of its outputs and UNIDO being the implementing agency was responsible for the delivery of the outputs. For example, UNIDO provided the assistance in the procurement process for electro-mechanical equipment for the demonstration schemes. In addition, UNIDO organised and supported several capacity building activities as part of the project.

UNIDO set up a Project Management Unit (PMU), which was responsible for day-to-day management and coordination of all project activities. The PMU was well-staffed, though there was a change of National Project Coordinator (NPC) during the execution of project, a handover was arranged to make a smooth transition from the outgoing NPC to the new NPC.

4.2. National Counterparts

Rural Energy Agency (REA), University of Dar es Salaam's College of Engineering and Technology (CoET) and the Ministry of Energy (MoE) were the key national counterparts in this project.

REA had an important role to play, including establishment of the SHP Centre and providing support in construction of various demonstration sites. In addition, REA had also committed to providing a co-financing to this project. In general, REA have been actively involved in this UNIDO project and provided the support in construction of demonstration projects. In addition, the SHP Centre has been fully established and is operating. However, it is not known to the evaluators whether the full co-financing (both cash and in-kind) as promised have been delivered or not.

Ministry of Energy is the umbrella public body on energy matters, including mini/micro hydro power. Given the main objective of the UNIDO project was to promote micro / mini hydropower based mini grids in Tanzania, a target for the project was to work with the MoE to establish the Feed-in-Tariff (FiT) in Tanzania for small scale hydro power projects. During the course of the project, the FiT has been established and implemented.

CoET was another key counterpart with the main responsibility to provide personnel and venue to establish the SHP Centre. In addition, once the SHP Centre was established, CoET was to undertake capacity building and other activities. SHP Centre has been established and has provided a number of capacity building training for local developers and other personnel and has established a workshop to manufacture crossflow turbines locally.

Based on the above discussion, the performance of the national counterparts is satisfactory.

4.3. Donor

The main donor agency is GEF, which was represented by UNIDO in implementation of this project. GEF, apart from providing the funds, was not envisaged to be involved directly in the project (as no specific roles assigned for GEF in the ProDoc) and hence their performance is not evaluated.

5. Overarching Assessment & Ratings Table

Mini-Grids Based on Small Hydropower Sources to Augment Rural Electrification project undertaken by UNIDO in Tanzania has been evaluated using several evaluation criteria using UNIDO guidelines and the detailed Terms of Reference provided to the Evaluation Team. Based on the discussion shown in the report earlier, in general, the project is regarded as successful in achieving the main outputs as envisaged in the ProDoc and the associated Logframe, despite some shortcomings are highlighted in relevant places in the document. The overall rating for the project is **Satisfactory** and the ratings for individual criteria are shown in Table 10.

Table 10: Project Ratings against Evaluation Criteria

<u>Evaluation criteria</u>	<u>Rating</u>
Project design	Satisfactory
• Overall design	Satisfactory
• Logframe	Satisfactory
Project performance	Satisfactory
• Relevance	Highly Relevant
• Effectiveness	Highly Satisfactory
• Efficiency	Moderately Satisfactory
• Sustainability	Moderately Likely
Cross-cutting performance criteria	Moderately Satisfactory
• Gender mainstreaming	Moderately Unsatisfactory
• Monitoring and Evaluation	Satisfactory
Performance of partners	Highly Satisfactory
• UNIDO	Highly Satisfactory
• National counterparts	Satisfactory
Overall assessment	Satisfactory

6. Conclusions and Recommendations

6.1. Conclusions

Based on the analysis and discussions in the report detailed above, the following conclusions are made.

- The project **Mini-Grids Based on Small Hydropower Sources to Augment Rural Electrification** has achieved significant results even though there were some aspects of the project that could be improved.
- Even though the original plan was to install nine hydropower demonstration schemes with a cumulative capacity of 3.2 MW, eight schemes at various stages of completion have been developed with cumulative capacity of 4,881 MW. Only four were operational at the time of the site visits by the evaluators.
- The project is on course to install over 4.0 MW of demonstration hydropower schemes as against the target of 3.2 MW, with an estimated GHG reduction of over 300,000 tons of CO₂ equivalent.
- UNIDO support through GEF funding has been able to galvanize other funding sources and also has been able to leverage regular REA funds and others such as UNCDF funds.
- Many of the operating demonstration schemes are not running at full capacity due to various reasons – including issues with distribution lines and grid connection – both technical and administrative.
- In some of the demonstration schemes, the revenue generated is not sufficient to cover the cost of operation of the schemes. This is due to low income levels among households, particularly in rural areas.
- TANESCO Power Purchase Agreement (PPA) signed with a demonstration project is only valid for one year giving rise to uncertainty and risk of potentially unviable tariff or agreement not being renewed.
- Though the project has helped women and children in a significant way, and gender disaggregated data are being collected, in the design of the project, gender issues are not considered.
- Even though the government has favourable policies to support small scale hydropower, awareness regarding the Feed-in-Tariff (FiT) and grid connection requirements is limited among developers of the hydropower schemes.
- Performance of UNIDO as the implementor of the project has been found to be highly satisfactory, and those of the National counterparts satisfactory.
- Some demonstration schemes faced problems due to user manuals for turbine and generator not supplied in English language.

- Application and approval of water rights for development of hydropower is complex and time consuming.

6.2. Recommendations

- Rural Energy Authority (REA) in collaboration with Tanzania Electricity Company Limited (TANESCO) should support the demonstration projects to achieve higher utilisation rates by assisting in extending the grid to connect more households and connection to the national or local grid.
- To improve the finances of the small hydro demonstration schemes, productive uses of electricity should be promoted by the government institutions such as REA and international agencies such as UNIDO in order to generate additional revenue from day-time use, thus improving the finances and sustainability of the schemes
- Awareness of government policy and guidelines regarding Feed-in-Tariff (FiT) and grid connection requirements among potential private developers of hydropower schemes should be improved by TANESCO, Ministry of Energy and the REA .
- TANESCO should ensure that the Power Purchase Agreements (PPAs) are for longer durations to provide incentive and reduce risks to private hydropower developers.
- Developers and UNIDO should insist on user manuals to be provided in English language as part of the contractual terms and conditions.
- The government or Water authorities should simplify the water permit procedures.

Annex 1: Evaluation Terms of Reference



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE

Independent terminal evaluation of the UNIDO project

Mini-Grids Based on Small Hydropower Sources to Augment Rural Electrification

UNIDO ID: 100261

GEF Project ID: 4004

February 2018

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I. PROJECT BACKGROUND AND CONTEXT

1. Project factsheet

Project title	Mini-Grids Based on Small Hydropower Sources to Augment Rural Electrification
UNIDO ID	100261
GEF Project ID	4004
Region	Africa
Country	[Keywords]
Project donor(s)	GEF
Project implementation start date	13 March 2012
Expected duration at project commencement	48 months
Implementation end date	30 June 2018
GEF Focal Areas and Operational Project	GEF-4: Climate Change; Strategic programme CC-SP3 – promoting markets for renewable energy
Other executing Partners	Ministry of Energy and Minerals (MEM); Rural Energy Agency (REA); Tanzania Electric Supply Company Limited (TANESCO)
Executing partners	UNIDO
UNIDO RBM code	GC32 (Clean energy access)
Donor funding	3,350,000
Project GEF CEO endorsement / approval date	11/7/2011
UNIDO input (USD)	Cash 80,000
Co-financing at CEO Endorsement, as applicable	9,778,500 (cash + in-kind)
Total project cost (USD)	13,188,500
Mid-term review date	December 2014-February 2015
Planned terminal evaluation date	May-July 2018

(Source: Project document)

2. Project context⁶

The United Republic of Tanzania has sustained relatively high economic growth over the last decade, averaging 6–7% a year. At 7%, in 2016, Tanzania’s economy expanded quickly, putting it close to the top of the fastest growing economies in Sub-Saharan Africa. This expansion softened during the last quarter of 2016, however, and continued to do so into 2017. While its poverty rate declined, its absolute number of poor has not because of its high population growth rate. The country's overall population was about 55 million in 2016.

In the past several years, Tanzania’s electricity access rate has risen noticeably. The number of people with access to electricity has reportedly increased from 7 % in 2011 to 36% in 2014. While noticeable progress has been achieved in urban and peri-urban areas, the pace of rural electrification, currently at 7%, lags substantially behind the national average. Given the importance of electricity access for reducing extreme poverty for both urban and rural populations and fostering opportunities for productive economic activities (including agriculture), scaling up access to modern forms of energy is a significant component of the GoT’s long-term economic growth plan. The GoT is

⁶ Data to be validated by the Consultant

targeting to increase the country's overall electricity connectivity level to 50 percent by 2025 and at least to 75 percent by 2033.

Tanzania also possesses substantial proven technical potential for generating power using small scale hydro power particularly in highland's headwater catchments. As of 2016, Tanzania's total power installed capacity was 1,357.69 MW composed of hydro 566.79 MW (42%), natural gas 607 MW (45%) and liquid fuel 173.40 MW (13%). Wide development of micro / mini hydro power had not been realized, despite its potential and available opportunities. Institutional structure to support the development of small hydropower schemes was inadequate; there was insufficient technical expertise; the cost of sourcing and importing equipment was high; and there was lacking local manufacturing capabilities/facilities.

In 2015, the assessed potential of small hydropower resources (up to 10 MW) was 480 MW. Installed, grid connected, small-hydro projects contributed only about 15 MW. Most of the developed small-hydro projects are owned by private entities and are not connected to the national electricity grid. Five sites in the 300 kW–8,000 kW range are owned by TANESCO. Faith-based groups own more than 1617 with 15 kW-800 kW capacity and an aggregate capacity of 2 MW.

The Government has established REA with the view to promote rural energy services, to facilitate modern energy projects for rural areas and to provide technical support for the developers. In addition, the Government has also established a Rural Energy Board (REB) and a Rural Energy Fund (REF). On the regulatory side, Standardized Power Purchase Agreement (SPPA) and Standardized Power Purchase Tariff (SPPT) exist for small power producers (SPPs). SPPT is revised on annual basis by the regulatory agency, Energy and Water Utilities Regulatory Authority (EWURA).

3. Project objective

The main objective of the project was to promote micro/mini hydropower based mini grids in Tanzania to augment rural electrification, and thus to achieve a reduction of GHG emissions related to the use of carbon intensive energy sources in rural areas of Tanzania.

The following 4 project components have been developed, in addition to project management, to achieve the project objectives:

Component 1: Techno-economic feasibility studies for the identified demonstration sites

Expected Outcome:

Site-specific details on potential micro / mini hydropower sites are available for further development.

Component 2: Capacity building of stakeholders in developing micro / mini hydropower based mini-grids

Expected Outcome:

Investment cost of micro / mini hydropower based mini-grids reduced because of the local availability of technical experts and high-quality indigenous hydropower equipment.

Component 3: Viable business model for micro / mini hydropower based mini-grid developed

Expected Outcome:

Interest in developing micro / mini hydropower projects increased among the local entrepreneurs.

Component 4: Demonstration of micro / mini hydropower plants

Expected Outcome:

Technical and economic viability of micro / mini hydropower technologies demonstrated.

The Project is further structured into a total of 10 outputs. The full logical framework is included as annex 1.

4. Project implementation arrangements

UNIDO is the GEF implementing agency and will take the responsibility of implementing the project, the delivery of the planned outputs and the achievement of the expected outcomes. The project will be executed by UNIDO in collaboration with the concerned Government Ministries and private sector stakeholders.

UNIDO will administer/manage and allocate the funds of the project on behalf of the GEF Secretariat. UNIDO will provide assistance in the procurement process for any acquired equipment if requested, in the selection of national and international consultants as well as the subcontractors in accordance with the operational rules and regulations.

UNIDO will also provide the assistance on the formal GEF procedures that will apply to project execution including reporting issues and be the formal channel of correspondence between the project and the GEF secretariat. GEF specialist will provide technical backstopping to the project as deemed necessary.

Rural Energy Agency (REA): responsible for

- Construction of the various demonstration sites;
- Establishment of the national micro/mini hydro technical centre; as well as
- Streamlining financing options for micro/mini hydro projects

College of Engineering and Technology (CoET): responsible for

- Providing staff for the national micro/mini hydro technical centre
- Preparing various training materials targeting different stakeholders
- Human and institutional capacity building in micro/mini hydro, by conducting suitable tailored trainings

Ministry of Energy and Minerals (MEM): responsible for

- Providing additional institutional support for the recommendations on Feed-In-Tariff (FiT) for renewable Energy projects including micro/mini hydro projects

Tanzania Electric Supply Company Limited (TANESCO): responsible for

- Publishing the adapted guidelines for micro/mini hydro installation and management

Project Management Unit (PMU): responsible for day-to-day management and coordination of all project activities

Project Steering Committee (PSC): responsible for the strategic guidance of the project includes a balanced representation from key stakeholders. The committee is chaired by the GEF Focal point (Operations) and is envisaged to meet twice a year.

Private sector stakeholders and other potential project participants will be actively engaged and integrated into the project.

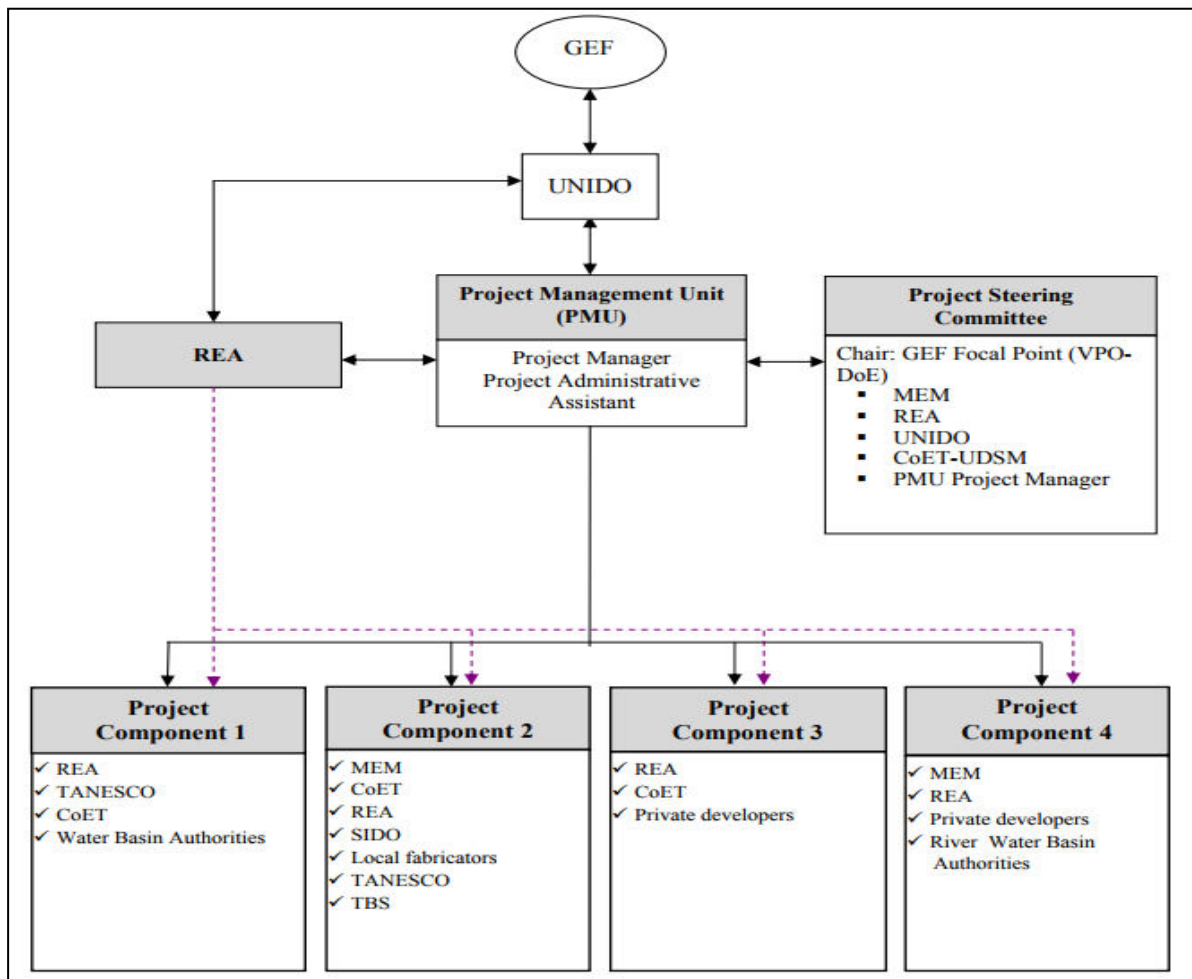


Figure 4. Schematic of project implementation arrangements

5. Main findings of the Mid-term review (MTR)

Project's design, relevance and effectiveness were rated as highly satisfactory. The mid-term review highlighted that all efforts were undertaken to ensure cost-effectiveness and 51 % of the co-financing had materialized. Efficiency was rated satisfactory despite implementation delays. The overall sustainability rating was LIKELY and the implementation of M&E and the project management were rated SATISFACTORY.

The overall rating for the project based on the evaluation findings was Highly Satisfactory

Recommendations included:

- Include gender mainstreaming in monitoring reports;
- UNIDO and Government counterparts should prepare a feasible sustainable business model for investments in small hydropower projects;
- The Government of Tanzania should conduct wider public awareness programmes for the new Feed-In-Tariff for Renewable Energy after its completion and passing;
- The Center for Small Hydropower at CoET UDSM should seek support from REA and other sources in order to secure its sustainability.
- UNIDO should improve communication between supplier and investors so that investors can prepare the construction works on time.

6. Budget information

Table 1: Financing plan summary

USD	Project Preparation	Project ⁷	Total (USD)
Financing (GEF / others)	60,000(PPG)	3,350,000	3,410,000
Co-financing (Cash and In-kind)	Click here to enter text.	9,778,500	9,778,500

Source: [Project document](#)

Table 2: Financing plan summary - Outcome breakdown⁸

Project outcomes	Donor (GEF/other) (USD)	Co-Financing (USD)	Total (USD)
1. Site-specific details on potential micro/ mini hydro power sites available for further development.	200,000	650,000	850,000
2. Investment cost of micro / mini hydropower based mini grids reduced because of the local availability of technical experts and high quality indigenous hydro power equipment.	700,000	700,000	1.400,000
3. Interest in developing micro / mini hydropower projects increased among the local entrepreneurs.	250,000	350,000	600,000
4. Technical and economic viability of micro / mini hydropower technologies demonstrated.	1,900,000	7,378,500	9,278,500
Project Management	300,000	700,000	1.000,000
Total (USD)	3,350,000	9,778,500	13.128,500

Source: [Project document](#)

Table 3: Co-Financing source breakdown

Name of Co-financier (source)	Classification	Type	Total Amount (USD)
UNIDO	Implementing Agency	Cash	80,000
Rural Energy Agency	National Government	In-kind and cash	7,000,000
Andoya Hydro-Electric	Private sector	Cash	2,500,000

⁷ Includes project management cost

⁸ Source: Project document.

Name of Co-financier (source)	Classification	Type	Total Amount (USD)
Power Company			
Ministry of Energy and Minerals	National Government	In-kind	36,000
College of Engineering and Technology	National Government	In kind	50,000
Behindertenhilfe Neckar-Alb	Donor	Cash	112,500
Total Co-financing (USD)			9,778,500

Source : Project document

Table 4: UNIDO budget execution in USD (Grant 200000332) 4000508, 500159 and 500275)

Item of expenditure	2012	2013	2014	2015	2016	2017	2018	Total Expenditure (USD)
Contractual Services		330,147	228,372	588,874	5,101	22,900	150	1,175,543
Equipment	41,132	2,939	1,080,855	179,680	119,518	-2,846	-100	1,421,178
International Meetings		9,911	2,879	-3,029	288	10,969		21,018
Local travel	7,686	4,898	44,722	22,237	5,355	20,635	-499	105,034
Nat. Consult./Staff	43,527	55,358	100,028	63,240	24,287	-7,271		279,169
Other Direct Costs	7,223	7,130	4,307	15,763	7,509	5,084	-7	47,010
Premises			84	9,953	103	286		10,427
Staff & Intern Consultants	40,002	15,210	16,184	24,089	16,216	31,505		143,206
Train/Fellowship /Study	15,685		47,806	364	240	474		64,570
Grand Total	155,254	425,594	1,525,239	901,172	178,618	81,735	-456	3,267,156

Source: UNIDO Project Management database as of 8 February 2018

Table 5: UNIDO budget execution in EUR (Grants 4000508, 500159 and 500275)

Item of expenditure	2012	2013	2014	2015	2016	2017	Total Expenditure (EUR)
Other Direct Costs						8	8
Staff Travel	6,331	0	2,587	-115	7,956	10,333	27,092
Grand Total	6,331	0	2,587	-115	7,956	10,341	27,100

Source: UNIDO Project Management database as of 8 February 2018

II. Scope and purpose of the evaluation

The purpose of the evaluation is to independently assess the project to help UNIDO improve performance and results of ongoing and future programmes and projects. The terminal evaluation (TE) will cover the whole duration of the project from its starting date in to the completion date in 6/30/2018.

The evaluation has two specific objectives:

- (i) Assess the project performance in terms of relevance, effectiveness, efficiency, sustainability and progress to impact;
- (ii) Develop a series of findings, lessons and recommendations for enhancing the design of new and implementation of ongoing and future projects by UNIDO.

III. Evaluation approach and methodology

The TE will be conducted in accordance with the UNIDO Evaluation Policy⁹ and the UNIDO Guidelines for the Technical Cooperation Project and Project Cycle¹⁰. In addition, the GEF Guidelines for GEF Agencies in Conducting Terminal Evaluations, the GEF Monitoring and Evaluation Policy and the GEF Minimum Fiduciary Standards for GEF Implementing and Executing Agencies will be applied.

The evaluation will be carried out as an independent in-depth evaluation using a participatory approach whereby all key parties associated with the project will be informed and consulted throughout the evaluation. The evaluation team leader will liaise with the UNIDO Independent Evaluation Division on the conduct of the evaluation and methodological issues.

The evaluation will use a theory of change approach and mixed methods to collect data and information from a range of sources and informants. It will pay attention to triangulating the data and information collected before forming its assessment. This is essential to ensure an evidence-based and credible evaluation, with robust analytical underpinning.

The theory of change will identify causal and transformational pathways from the project outputs to outcomes and longer-term impacts, and drivers as well as barriers to achieve them. The learning from this analysis will be useful to feed into the design of the future projects so that the management team can effectively manage them based on results.

1. Data collection methods

Following are the main instruments for data collection:

- (a) **Desk and literature review** of documents related to the project, including but not limited to:
 - The original project document, monitoring reports (such as progress and financial reports, mid-term review report, output reports, back-to-office mission report(s), end-of-contract report(s) and relevant correspondence.
 - Notes from the meetings of committees involved in the project.
- (b) **Stakeholder consultations** will be conducted through structured and semi-structured interviews and focus group discussion. Key stakeholders to be interviewed include:
 - UNIDO Management and staff involved in the project; and
 - Representatives of donors and counterparts.
- (c) **Field visit** to project sites in the United Republic of Tanzania.

2. Evaluation key questions and criteria

⁹ UNIDO. (2015). Director General's Bulletin: Evaluation Policy (UNIDO/DGB/(M).98/Rev.1)

¹⁰ UNIDO. (2006). Director-General's Administrative Instruction No. 17/Rev.1: Guidelines for the Technical Cooperation Programme and Project Cycle (DGAI.17/Rev.1, 24 August 2006)

The key evaluation questions are the following:

- (a) Against a changing environment in the electricity sector, what is the continued relevance of the project?
- (b) What are the key drivers and barriers to achieve the long-term objectives? To what extent has the project helped put in place the conditions likely to address the drivers, overcome barriers and contribute to the long-term objectives?
- (c) How well has the project performed? Has the project done the right things? Has the project done things right, with good value for money?
- (d) What have been the project's key results (outputs, outcome and impact)? To what extent have the expected results been achieved or are likely to be achieved? To what extent the achieved results will sustain after the completion of the project?
- (e) What lessons can be drawn from the successful and unsuccessful practices in designing, implementing and managing the project?

The evaluation will assess the likelihood of sustainability of the project results after the project completion. The assessment will identify key risks (e.g. in terms of financial, socio-political, institutional and environmental risks) and explain how these risks may affect the continuation of results after the project ends. Table provides the key evaluation criteria to be assessed by the evaluation. The detailed questions to assess each evaluation criterion are provided in annex 2.

Table 6: Project evaluation criteria

#	<u>Evaluation criteria</u>	<u>Mandatory rating</u>
A	Impact	Yes
B	Project design	Yes
1	• Overall design	Yes
2	• Logframe	Yes
C	Project performance	Yes
1	• Relevance	Yes
2	• Effectiveness	Yes
3	• Efficiency	Yes
4	• Sustainability of benefits	Yes
D	Cross-cutting performance criteria	
1	• Gender mainstreaming	Yes
2	• M&E: ✓ M&E design ✓ M&E implementation	Yes
3	• Results-based Management (RBM)	Yes
E	Performance of partners	
1	• UNIDO	Yes
2	• National counterparts	Yes
3	• Donor	Yes
F	Overall assessment	Yes

3. Rating system

In line with the practice adopted by many development agencies, the UNIDO Independent Evaluation Division uses a six-point rating system, where 6 is the highest score (highly satisfactory) and 1 is the lowest (highly unsatisfactory) as per Table .

Table 7: Project rating criteria

Score		Definition	Category
6	Highly satisfactory	Level of achievement clearly exceeds expectations and there is no shortcoming.	SATISFACTORY
5	Satisfactory	Level of achievement meets expectations (indicatively, over 80-95 per cent) and there is no or minor shortcoming.	
4	Moderately satisfactory	Level of achievement more or less meets expectations (indicatively, 60 to 80 per cent) and there are some shortcomings.	
3	Moderately unsatisfactory	Level of achievement is somewhat lower than expected (indicatively, less than 60 per cent) and there are significant shortcomings.	UNSATISFACTORY
2	Unsatisfactory	Level of achievement is substantially lower than expected and there are major shortcomings.	
1	Highly unsatisfactory	Level of achievement is negligible and there are severe shortcomings.	

IV Evaluation process

The evaluation will be implemented in five phases which are not strictly sequential, but in many cases iterative, conducted in parallel and partly overlapping:

- i. Inception phase: The evaluation team will prepare the inception report providing details on the methodology for the evaluation and include an evaluation matrix with specific issues for the evaluation; the specific site visits will be determined during the inception phase, taking into consideration the findings and recommendations of the mid-term review, if there is any.
- ii. Desk review and data analysis;
- iii. Interviews, survey and literature review;
- iv. Country visits;
- v. Data analysis and report writing.

V. Time schedule and deliverables

The evaluation will be conducted from May to July 2018. The evaluation field mission is tentatively planned in May 2018. At the end of the field mission, there will be a presentation of the preliminary findings for all stakeholders involved in this project in . Main timelines are provided in

Table .

After the evaluation field mission, the evaluation team leader will visit UNIDO HQ for debriefing and presentation of the preliminary findings of the terminal evaluation. The draft TE report will be submitted no later than 4 weeks before the end of the assignment. The draft TE report is to be shared with the UNIDO PM, UNIDO Independent Evaluation Division, the UNIDO GEF Coordinator and GEF OFP and other stakeholders for receipt of comments. The ET leader is expected to revise the draft TE report based on the comments received, edit the language and form and submit the final version of the TE report in accordance with UNIDO Independent Evaluation Division standards.

Table 8: Tentative timelines

Timelines	Tasks
Two weeks after contract completion	Desk review and writing of inception report
Shortly before the field mission	Interview with the project manager and team at UNIDO HQ (or alternatively skype call)
Tentatively in May 2018	Field visit
Upon completion of field mission Latest 4 weeks before the end of the assignment	Debriefing in Vienna Preparation of first draft evaluation report
Two weeks after submission of draft evaluation report	Internal peer review of the report by the UNIDO Independent Evaluation Division and other stakeholder comments to draft evaluation report
End of June 2018	Final evaluation report

VI. Evaluation team composition

The evaluation team will be composed of one international evaluation consultant acting as the team leader and one national evaluation consultant. The evaluation team members will possess relevant strong experience and skills on evaluation management and conduct together with expertise and experience in innovative clean energy technologies. Both consultants will be contracted by UNIDO.

The tasks of each team member are specified in the job descriptions annexed to these terms of reference. The ET is required to provide information relevant for follow-up studies, including terminal evaluation verification on request to the GEF partnership up to three years after completion of the terminal evaluation.

According to UNIDO Evaluation Policy, members of the evaluation team must not have been directly involved in the design and/or implementation of the project under evaluation.

The UNIDO Project Manager and the project team in United Republic of Tanzania will support the evaluation team. The UNIDO GEF Coordinator and GEF OFP(s) will be briefed on the evaluation and provide support to its conduct. GEF OFP(s) will, where applicable and feasible, also be briefed and debriefed at the start and end of the evaluation mission.

An evaluation manager from UNIDO Independent Evaluation Division will provide technical backstopping to the evaluation team and ensure the quality of the evaluation. The UNIDO Project Manager and national project teams will act as resourced persons and provide support to the evaluation team and the evaluation manager.

VII. Reporting

I. Inception report

This Terms of Reference (ToR) provides some basic requirements regarding the evaluation methodology, but this should not be regarded as exhaustive. After reviewing the project documentation and initial interviews with the project manager, the International Evaluation Consultant will prepare, in collaboration with the national consultant, a short inception report that will operationalize the ToR relating to the evaluation questions and provide information on what type of and how the evidence will be collected (methodology). It will be discussed with and approved by the responsible UNIDO Independent Evaluation Division Evaluation Manager.

The Inception Report will focus on the following elements: preliminary project theory of change; elaboration of evaluation methodology including quantitative and qualitative approaches through an evaluation framework (“evaluation matrix”); division of work between the International Evaluation Consultant and national consultant; mission plan, including places to be visited, people to be interviewed and possible surveys to be conducted and a debriefing and reporting timetable¹¹.

As indicated above, during the inception phase the evaluation team will determine the criteria to select the project sites to be visited during the field mission so as to ensure that the sample of the sites is representative vis-à-vis achieving the evaluation objectives. The selection criteria should, inter alia consider features of the station, such as the power, type of developer, actual or planned productive activities supported, as well as geographical location, with a view to optimizing the mission results in the limited time available time.

The evaluation team will also provide an evaluation plan to cover the sites left out of the mission agenda.

Table provides a list of project sites and indicates the current development status in each case.

¹¹ The evaluator will be provided with a Guide on how to prepare an evaluation inception report prepared by the UNIDO Independent Evaluation Division.

Table 9: Project sites

S. No.	Project Name	Location	Developer	Capacity (kW)	UNIDO Support	Status (Feb 2018)
1	Andoya small hydropower Project	Mbinga, Ruvuma	Andoya Hydroelectric Power Limited	1,000	Partial support for equipment	500kW unit is operational; second 500 kW unit from CHINA has arrived to site and now awaiting installation and commissioning.
2	Tandala mini hydro project	Tandala, Makete, Njombe	Tandala Diaconical Centre	360	Full support for equipment through direct procurement	Electro-mechanical equipment has been delivered to site. The developer is finalizing the process of mobilizing funds from REA for connecting to the grid and Bank of Africa (BoA) for construction of weir and powerhouse.
3	Mpando Mini hydro power Project	Imalinyi, Njombe	Imilinyi Village cooperative	320	Full support for equipment through direct procurement	Electro-mechanical equipment has been delivered to site. REA is reviewing the project documents for funds applications.
4	Lupali mini hydro power project	Lupali, Njombe	Benedictine Sisters Convent	353	Full support for equipment through direct procurement	Electro-mechanical equipment has been delivered to site. The developer is awaiting financial support (grant) from REA to construct the weir and powerhouse. The transmission network has been completed.
5	Kiliflora mini hydropower project	Usa River, Arusha	Kiliflora Company Ltd	230	Full support for equipment through direct procurement	The power plant has been operational for over a year.

S. No.	Project Name	Location	Developer	Capacity (kW)	UNIDO Support	Status (Feb 2018)
6	Salala micro hydropower project	Ludilu, Makete, Njombe	SCD-Ludilu Parish	68	Full support for equipment through direct procurement.	The power plant is operational. The transmission and distribution lines cover over 50 households and SME's. The developer is waiting for further funds from UNDP and REA to extend both transmission and distribution.
7	Madope small hydropower project	Lugarawa, Ludewa, Njombe	Njombe Diocese, RC Church	1,700	Direct subsidy to cover part of equipment cost	Powerhouse construction is about 90% completed; civil works is about 60% completed, transmission and distribution network is about 70% completed.
8	Ifumbo Mini hydropower project	Mahenge, Ulanga, Morogoro	St. Franciscan Sisters of Charity	850	Generator procurement	The power plant is operational. The developer is communicating with TANESCO to export the excess electricity being generated to the national grid
TOTAL installed capacity in MWs				4,881		

Evaluation report format and review procedures

The draft report will be delivered to the Independent Evaluation Division (the suggested report outline is in Annex 4) and circulated to UNIDO staff and national stakeholders associated with the project for factual validation and comments. Any comments or responses, or feedback on any errors of fact to the draft report provided by the stakeholders will be sent to the Independent Evaluation Division for collation and onward transmission to the project evaluation team who will be advised of any necessary revisions. On the basis of this feedback, and taking into consideration the comments received, the evaluation team will prepare the final version of the terminal evaluation report.

The ET will present its preliminary findings to the local stakeholders at the end of the field visit and take into account their feed-back in preparing the evaluation report. A presentation of preliminary findings will take place at UNIDO HQ after the field mission.

The TE report should be brief, to the point and easy to understand. It must explain the purpose of the evaluation, exactly what was evaluated, and the methods used. The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should provide information on when the evaluation took place, the places visited, who was involved and be presented in a way that makes the information accessible and comprehensible. The report should include an executive summary that encapsulates the essence of the information contained in the report to facilitate dissemination and distillation of lessons.

Findings, conclusions and recommendations should be presented in a complete, logical and balanced manner. The evaluation report shall be written in English and follow the outline given in annex 4.

II. Quality assurance

All UNIDO evaluations are subject to quality assessments by UNIDO Independent Evaluation Division. Quality assurance and control is exercised in different ways throughout the evaluation process (briefing of consultants on methodology and process of UNIDO Independent Evaluation Division, providing inputs regarding findings, lessons learned and recommendations from other UNIDO evaluations, review of inception report and evaluation report).

The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality, attached as Annex 5. The applied evaluation quality assessment criteria are used as a tool to provide structured feedback. UNIDO Independent Evaluation Division should ensure that the evaluation report is useful for UNIDO in terms of organizational learning (recommendations and lessons learned) and is compliant with UNIDO's evaluation policy and these terms of reference. The draft and final evaluation report are reviewed by UNIDO Independent Evaluation Division, which will submit the final report to the GEF Evaluation Office and circulate it within UNIDO together with a management response sheet

A. Annex 1: Project Results Framework

Project Strategy		Objectives verifiable indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
Goal	To reduce GHG emissions related to the use of carbon intensive energy sources in rural areas in Tanzania.	<ol style="list-style-type: none"> 1. Percentage increment in use of micro / mini hydropower based electricity by rural population. 2. Percentage Increment in CO₂e emission reductions (t CO₂e). 	<ol style="list-style-type: none"> 1. Only 2% of rural population has access to grid electricity. 2. CO₂ emission due to diesel based local power generation. 	A cumulative of 3.2 MW micro / mini hydropower based mini-grids installed during the project duration (2011-2015).	<ol style="list-style-type: none"> 1. Physical verification of the projects in operation. 2. End of project M&E report. 	<ol style="list-style-type: none"> 1. Continuous support of relevant government departments and private investors are in place. 2. Policies are in place.
Objective of the project	To promote micro / mini hydropower based mini grids in Tanzania to augment rural electrification.	<ol style="list-style-type: none"> 1. Number of MWs of micro / mini hydropower based mini-grids in operational. 2. Number of locally fabricated micro / mini hydropower equipments and accessories. 3. Number of institutions and entrepreneurs available for developing micro / mini hydropower plants. 4. FiT for RE including small/micro / mini hydropower plants in place. 	<ol style="list-style-type: none"> 1. Only 2% of rural population has access to grid electricity. 2. No local fabricators available for micro / mini hydropower equipments. 3. Lack of technical capacity (human and institutional). 4. Weak policy and regulatory regime. 	<ol style="list-style-type: none"> 1. 3.2 MW (cumulative capacity) of micro / mini hydropower plants with mini-grids established. 2. At least 5 institutions and 5 entrepreneurs available for developing micro / mini hydropower plants. 3. FiT for RE including small/micro / mini hydropower plants established. 	<ol style="list-style-type: none"> 1. Physical verification of the implemented projects. 2. Physical verification of the fabrication units. 3. Published FiT rates for micro / mini hydropower mini-grids. 	<ol style="list-style-type: none"> 1. Sustained support of the Government (through different policies), REA, all project participants and project investors. 2. Interested local fabricators available.

Project Strategy		Objectives verifiable indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
Outcome 1	Site specific details on potential micro / mini hydropower sites available for further development.	1. Detailed techno-economic feasibility studies for the identified 9 demonstration sites..	1. Lack of detailed studies for the demonstration sites.	1. Feasibility studies of identified demonstration sites developed.	1. Feasibility study reports.	Continuous support of Government agencies, national utility and the private sector.
Project Component 1: Techno-economic feasibility studies for the identified demonstration sites						
Output 1.1	Detailed feasibility studies and plant designs prepared for the demonstrations in the identified potential sites.	Number of feasibility reports of the demonstration sites (cumulative 3.2 MW).	No feasibility studies exist for the micro / mini hydropower plants development.	To undertake feasibility studies of demonstration sites.	9 feasibility study reports including plant designs for the demonstration sites.	Sustained private and Government support upon agreed project activities.
Outcome 2	Investment cost of micro / mini hydropower based mini-grids reduced because of the local availability of technical experts and high quality indigenous hydropower equipments.	<ol style="list-style-type: none"> 1. Number of trained local planners and experts on micro / mini hydropower based mini-grids. 2. Number of institutions capable of guiding and supporting micro / mini hydropower plant development in future. 3. Number of micro / mini hydropower turbines and controls systems manufacturing facilities operating in the country. 	<ol style="list-style-type: none"> 1. No sufficient local knowledge exists on developing, implementing and managing the micro / mini hydropower projects. 2. Inadequate institutional capacity exists in the country. 3. Micro / mini hydropower turbines and control systems are imported. 	<ol style="list-style-type: none"> 1. To strengthen the capacity of atleast 100 persons from CoET, experts, planners and other relevant stakeholders to support micro / mini hydropower mini-grids development in the country. 2. To build capacity of TANESCO and River Basin Authorities in developing and managing micro / mini hydropower systems. 	<ol style="list-style-type: none"> 1. Number of trained persons. 2. Number of institutions capable of guiding and supporting micro / mini hydropower plant. 3. Physical verification of operating personnel in the power plant. 4. Training materials. 5. Training evaluation report. 6. Number of trained 	<ol style="list-style-type: none"> 1. Sustained private, institution and Government support upon agreed project activities. 2. Interest of local fabricators.

Project Strategy		Objectives verifiable indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
				3. To transfer technology for facilitating local fabrication of micro / mini hydropower plant equipments to at least 5 interested suppliers.	fabricators. 7. Physical verification of the manufacturing facilities.	
Project Component 2: Capacity building of stakeholders in developing micro / mini hydropower based mini-grids						
Output 2.1	National micro / mini hydropower technical centre established at CoET, UDSM to provide technical support for various technical institutions in Tanzania.	Approval received and Centre operating.	Insufficient technical capacity exists in various institutions on micro / mini hydropower systems.	To establish the centre, strengthen it with trained personnel and equip with necessary tools and systems for micro / mini hydropower plant development.	1. Physical verification. 2. Government reports. 3. End of project M&E report.	Continuous support of the participating technical institutions, private sector and Government of Tanzania.
Output 2.2	Technology transferred for local fabrication of micro / mini hydropower equipments.	1. Number of local fabricators trained and licensed in manufacturing of micro / mini hydropower equipments. 2. Number of locally fabricated turbines used in at least 2 installations of the project.	All hydropower equipments imported.	1. To transfer and adapt micro / mini hydro turbine technology to Tanzania. 2. To train at least 5 interested suppliers.	1. No. of trained fabricators 2. License certificates 3. Training evaluation report 4. No. of trained persons 5. Physical verification	Interest of local fabricators and investors.

Project Strategy		Objectives verifiable indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
Output 2.3	Existing guidelines and standards adapted to suit installation and management of micro / mini hydropower plant mini-grids in Tanzania.	Existing guidelines and standards adapted to suit the micro / mini hydropower development, installation and commissioning in Tanzania	No guidelines and standards exist for micro / mini hydropower installation and management. Current focus is on large hydropower plants only.	To prepare and disseminate guidelines and standards on installation and management of micro / mini hydropower mini-grid projects.	1. Guidelines on project development, installation and commissioning. 2. Government reports.	Continuous support of Government, close collaboration of TANESCO and TBS.
Output 2.4	Feed-in tariff for micro / mini hydropower in place.	Feed-in-tariff system favouring RE including micro / mini hydropower market available.	No market based systems favouring RE including micro / mini hydropower exists in the country.	To facilitate introduction of feed-in-tariff for micro / mini hydropower systems	Communiqué of regulatory authority.	Sustained collaboration among Government, micro / mini hydropower training centre, relevant institutions and private stakeholders.
Outcome 3	Interest in developing micro / mini hydropower projects increased among the local entrepreneurs.	1. Number of micro / mini hydropower plants developed and invested by local entrepreneurs.	1. Low interest from private entrepreneurs to engage in micro / mini hydropower development.	1. To create interest among investors and entrepreneurs in micro / mini hydropower projects of at least 24 MW capacity	1. Number of investors. 2. Business models developed. 3. Physical verification of the operating power plants	Interest of local entrepreneurs.
Project Component 3: Developing viable business models for micro / mini hydropower based mini-grid						
Output 3.1	Existing financing options of REA streamlined to benefit local entrepreneurs	Percentage increase in engagement of local entrepreneurs to develop micro / mini hydropower	Low interest from private entrepreneurs to engage in micro / mini hydropower	At least 10 private sector initiatives facilitated for micro / mini hydropower based	1. Project progress reports. 2. End of Project	Sustained support of Government and the private stakeholders.

Project Strategy		Objectives verifiable indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
	interested in micro / mini hydropower.	projects.	project development.	mini-grids.	survey.	
Outcome 4	Technical and economic viability of micro / mini hydropower technologies demonstrated.	<ol style="list-style-type: none"> 1. Number of rural households with access to electricity. 2. Number of micro / mini hydropower plants in operation. 	Only around 2% of the rural population has access to grid electricity.	To establish at least 3.2 MW (cumulative) capacity of micro / mini hydropower based mini-grids in rural areas.	<ol style="list-style-type: none"> 1. Physical verification. 2. Report of commissioning. 	Sustained support of Government and private stakeholders.
Project Component 4: Demonstration of micro / mini hydropower plant based mini-grids						
Output 4.1	3.2 MW implemented in different locations within the country.	Micro / mini hydropower power plants established and running in different sites of Tanzania.	Currently only 5 MW of the potential 250 MW micro / mini hydropower exist.	To develop micro / mini hydropower plants within the capacity ranging from 98 kW – 1MW in selected sites.	<ol style="list-style-type: none"> 1. Physical verification of the implemented projects. 2. Performance monitoring report 3. Site visit / seminar. 4. Seminar material, leaflets, various publications and website. 	<ol style="list-style-type: none"> 1. Sustained support of the Government. 2. Sustained investor support to visit the project while in operation and data collection.

B. Annex 2: Suggested detailed questions to assess evaluation criteria

The evaluation team will assess the project performance guided by the questions below.

#	<u>Evaluation criteria</u>
A	<p>Progress to impact</p> <ul style="list-style-type: none"> ✓ <u>Mainstreaming</u>: To what extent information, lessons or specific results of the project are incorporated into broader stakeholder mandates and initiatives such as laws, policies, regulations and project? ✓ <u>Replication</u>: To what extent the project's specific results (e.g. methodology, technology, lessons, etc.) are reproduced or adopted ✓ <u>Scaling-up</u>: To what extent the project's initiatives and results are implemented at larger geographical scale? ✓ What difference has the project made to the beneficiaries? ✓ What is the change attributable to the project? To what extent? ✓ What are the social, economic, environmental and other effects, either short-, medium- or long-term, on a micro- or macro-level? ✓ What effects are intended or unintended, positive or negative? <p>The three UNIDO impact dimensions are:</p> <ul style="list-style-type: none"> ✓ <u>Safeguarding environment</u>: To what extent the project contributes to changes in the status of environment. ✓ <u>Economic performance</u>: To what extent the project contributes to changes in the economic performance (e.g. finances, income, costs saving, expenditure) of individuals, groups and entities? ✓ <u>Social inclusiveness</u>: To what extent the project contributes to changes in capacity and capability of individuals, groups and entities in society, such as employment, education, and training?
B	Project design
1	<ul style="list-style-type: none"> • <u>Overall design</u> ✓ The project design was adequate to address the problems at hand? ✓ Is the project consistent with the Country's priorities, in the work plan of the lead national counterpart? Does it meet the needs of the target group? Is it consistent with UNIDO's Inclusive and Sustainable Industrial Development? Does it adequately reflect lessons learnt from past projects? Is it in line with the donor's priorities and policies? ✓ Is the applied project approach sound and appropriate? Is the design technically feasible and based on best practices? Does UNIDO have in-house technical expertise and experience for this type of intervention? ✓ To what extent the project design (in terms of funding, institutional arrangement, implementation arrangements...) as foreseen in the project document still valid and relevant? ✓ Does the project document include a M&E plan? Does the M&E plan specify what, who and how frequent monitoring, review, evaluations and data collection will take place? Does it allocate budget for each exercise? Is the M&E budget adequately allocated and consistent with the logframe (especially indicators and sources of verification)? ✓ Were there any changes in project design and/or expected results after start of implementation. ✓ Did the project establish a baseline (initial conditions)? Was the evaluation able to estimate the baseline conditions so that results can be determined? ✓ Risk management: Are critical risks related to financial, social-political, institutional,

#	<u>Evaluation criteria</u>
	environmental and implementation aspects identified with specific risk ratings? Are their mitigation measures identified? Where possible, are the mitigation measures included in project activities/outputs and monitored under the M&E plan?
2	<ul style="list-style-type: none"> • <u>Logframe</u> ✓ Expected results: Is the expected result-chain (impact, outcomes and outputs) clear and logical? Does impact describe a desired long-term benefit to a society or community (not as a mean or process), do outcomes describe change in target group's behaviour/performance or system/institutional performance, do outputs describe deliverables that project will produce to achieve outcomes? Are the expected results realistic, measurable and not a reformulation or summary of lower level results? Do outputs plus assumptions lead to outcomes, do outcomes plus assumptions lead to impact? Can all outputs be delivered by the project, are outcomes outside UNIDO's control but within its influence? ✓ Indicators: Do indicators describe and specify expected results (impact, outcomes and outputs) in terms of quantity, quality and time? Do indicators change at each level of results and independent from indicators at higher and lower levels? Do indicators not restate expected results and not cause them? Are indicators necessary and sufficient and do they provide enough triangulation (cross-checking)? Are they indicators sex-disaggregated, if applicable? ✓ Sources of verification: Are the sources of verification/data able to verify status of indicators, are they cost-effective and reliable? Are the sources of verification/data able to verify status of output and outcome indicators before project completion?
C	Project performance
1	<ul style="list-style-type: none"> • <u>Relevance</u> ✓ How does the project fulfil the urgent target group needs? ✓ To what extent is the project aligned with the development priorities of the country (national poverty reduction strategy, sector development strategy)? ✓ How does project reflect donor policies and priorities? ✓ Is the project a technically adequate solution to the development problem? Does it eliminate the cause of the problem? ✓ To what extent does the project correspond to UNIDO's comparative advantages? ✓ Are the original project objectives (expected results) still valid and pertinent to the target groups? If not, have they been revised? Are the revised objectives still valid in today's context?
2	<ul style="list-style-type: none"> • <u>Effectiveness</u> ✓ What are the main results (mainly outputs and outcomes) of the project? What have been the quantifiable results of the project? ✓ To what extent did the project achieve its objectives (outputs and outcomes), against the original/revised target(s)? ✓ What are the reasons for the achievement/non-achievement of the project objectives? ✓ What is the quality of the results? How do the stakeholders perceive them? What is the feedback of the beneficiaries and the stakeholders on the project effectiveness? ✓ To what extent is the identified progress result of the project rather than external factors? ✓ What can be done to make the project more effective? ✓ Were the right target groups reached?
3	<ul style="list-style-type: none"> • <u>Efficiency</u> ✓ How economically are the project resources/inputs (concerning funding, expertise, time...) being used to produce results? ✓ To what extent were expected results achieved within the original budget? If no, please

#	<u>Evaluation criteria</u>
	<p>explain why.</p> <ul style="list-style-type: none"> ✓ Are the results being achieved at an acceptable cost? Would alternative approaches accomplish the same results at less cost? ✓ What measures have been taken during planning and implementation to ensure that resources are efficiently used? Were the project expenditures in line with budgets? ✓ To what extent did the expected co-financing materialize, in cash or in-kind, grants or loan? Was co-financing administered by the project management or by some other organization? Did short fall in co-financing or materialization of greater than expected co-financing affected project results? ✓ Could more have been achieved with the same input? ✓ Could the same have been achieved with less input? ✓ How timely was the project in producing outputs and outcomes? Comment on the delay or acceleration of the project's implementation period. ✓ To what extent were the project's activities in line with the schedule of activities as defined by the Project Team and annual Work Plans? ✓ Have the inputs from the donor, UNIDO and Government/counterpart been provided as planned, and were they adequate to meet the requirements?
4	<ul style="list-style-type: none"> • <u>Sustainability of benefits</u> ✓ Will the project results and benefits be sustained after the end of donor funding? ✓ Does the project have an exit strategy? <p><i>Financial risks:</i></p> <ul style="list-style-type: none"> ✓ What is the likelihood of financial and economic resources not being available once the project ends? <p><i>Socio-political risks:</i></p> <ul style="list-style-type: none"> ✓ Are there any social or political risks that may jeopardize the sustainability of project outcomes? ✓ What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? ✓ Do the various key stakeholders see that it is in their interest that project benefits continue to flow? ✓ Is there sufficient public/stakeholder awareness in support of the project's long-term objectives? <p><i>Institutional framework and governance risks:</i></p> <ul style="list-style-type: none"> ✓ Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize the sustainability of project benefits? ✓ Are requisite systems for accountability and transparency and required technical know-how in place? <p><i>Environmental risks:</i></p> <ul style="list-style-type: none"> ✓ Are there any environmental risks that may jeopardize the sustainability of project outcomes? ✓ Are there any project outputs or higher level results that are likely to have adverse environmental impacts, which, in turn, might affect the sustainability of project benefits?
D	Cross-cutting performance criteria
1	<ul style="list-style-type: none"> • <u>Gender mainstreaming</u> ✓ Did the project design adequately consider the gender dimensions in its interventions? Was the gender marker assigned correctly at entry? ✓ Was a gender analysis included in a baseline study or needs assessment (if any)? Were there gender-related project indicators?

#	<u>Evaluation criteria</u>
	<ul style="list-style-type: none"> ✓ Are women/gender-focused groups, associations or gender units in partner organizations consulted/ included in the project? ✓ How gender-balanced was the composition of the project management team, the Steering Committee, experts and consultants and the beneficiaries? ✓ Do the results affect women and men differently? If so, why and how? How are the results likely to affect gender relations (e.g., division of labour, decision-making authority)? ✓ To what extent were socioeconomic benefits delivered by the project at the national and local levels, including consideration of gender dimensions?
2	<ul style="list-style-type: none"> • <u>M&E:</u> ✓ M&E design <ul style="list-style-type: none"> ○ Was the M&E plan at the point of project approval practical and sufficient? ○ Did it include baseline data and specify clear targets and appropriate indicators to track environmental, gender, and socio-economic results? ○ Did it include a proper M&E methodological approach; specify practical organization and logistics of the M&E activities including schedule and responsibilities for data collection; ○ Did it include budget adequate funds for M&E activities? ✓ M&E implementation <ul style="list-style-type: none"> ○ How was the information from M&E system used during the project implementation? Was an M&E system in place and did it facilitate timely tracking of progress toward project results by collecting information on selected indicators continually throughout the project implementation period? Did project team and manager make decisions and corrective actions based on analysis from M&E system and based on results achieved? ○ Are annual/progress project reports complete and accurate? ○ Was the information provided by the M&E system used to improve performance and adapt to changing needs? Was information on project performance and results achievement being presented to the Project Steering Committee to make decisions and corrective actions? Do the Project team and managers and PSC regularly ask for performance and results information? ○ Are monitoring and self-evaluation carried out effectively, based on indicators for outputs, outcomes and impact in the logframe? Do performance monitoring and reviews take place regularly? ○ Were resources for M&E sufficient? ○ How has the logframe been used for Monitoring and Evaluation purposes (developing M&E plan, setting M&E system, determining baseline and targets, annual implementation review by the Project Steering Committee...) to monitor progress towards expected outputs and outcomes? ○ How well have risks outlined the project document and in the logframe been monitored and managed? How often have risks been reviewed and updated? Has a risk management mechanism been put in place?
3	<ul style="list-style-type: none"> • <u>Project management</u> ✓ Review overall effectiveness of project management as outlined in the Project Document. Have changes been made and are they effective? Are responsibilities and reporting lines clear? Is decision-making transparent and undertaken in a timely manner? Recommend areas for improvement. ✓ Review whether the national management and overall coordination mechanisms have been efficient and effective? Did each partner have assigned roles and responsibilities from the beginning? Did each partner fulfil its role and responsibilities (e.g. providing strategic support, monitoring and reviewing performance, allocating funds, providing technical support, following up agreed/corrective actions)? ✓ The UNIDO HQ-based management, coordination, monitoring, quality control and technical

#	<u>Evaluation criteria</u>
	inputs have been efficient, timely and effective (e.g. problems identified timely and accurately; quality support provided timely and effectively; right staffing levels, continuity, skill mix and frequency of field visits)?
E	Performance of partners
1	<ul style="list-style-type: none"> • <u>UNIDO</u> ✓ Design <ul style="list-style-type: none"> ○ Mobilization of adequate technical expertise for project design ○ Inclusiveness of project design (with national counterparts) ○ Previous evaluative evidence shaping project design ○ Planning for M&E and ensuring sufficient M&E budget ✓ Implementation <ul style="list-style-type: none"> ○ Timely recruitment of project staff ○ Appropriate use of funds, procurement and contracting of goods and services ○ Project modifications following changes in context or after the Mid-Term Review ○ Follow-up to address implementation bottlenecks ○ Role of UNIDO country presence (if applicable) supporting the project ○ Engagement in policy dialogue to ensure up-scaling of innovations ○ Coordination function ○ Exit strategy, planned together with the government
2	<ul style="list-style-type: none"> • <u>National counterparts</u> ✓ Design <ul style="list-style-type: none"> ○ Responsiveness to UNIDO's invitation for engagement in designing the project ✓ Implementation <ul style="list-style-type: none"> ○ Ownership of the project ○ Support to the project, based on actions and policies ○ Counterpart funding ○ Internal government coordination ○ Exit strategy, planned together with UNIDO, or arrangements for continued funding of certain activities ○ Facilitation of the participation of Non-Governmental Organizations(NGOs), civil society and the private sector where appropriate ○ Suitable procurement procedures for timely project implementation ○ Engagement with UNIDO in policy dialogue to promote the up-scaling or replication of innovations
3	<ul style="list-style-type: none"> • <u>Donor</u> ✓ Timely disbursement of project funds ✓ Feedback to progress reports, including Mid-Term Evaluation ✓ Support by the donor's country presence (if applicable) supporting the project for example through engagement in policy dialogue
F	<p>Overall project achievement</p> <ul style="list-style-type: none"> ✓ Overarching assessment of the project, drawing upon the analysis made under Project performance and Progress to Impact criteria above but not an average of ratings.

C. Annex 3: Job descriptions



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	International evaluation consultant, team leader
Main Duty Station and Location:	Home-based
Missions:	Missions to Vienna, Austria and United Republic of Tanzania
Start of Contract (EOD):	May 2018
End of Contract (COB):	July 2018
Number of Working Days:	24 working days spread over the above-mentioned period

1. ORGANIZATIONAL CONTEXT

The UNIDO Independent Evaluation Division (ODG/EIO/IED) is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes. Independent evaluations provide evidence-based information that is credible, reliable and useful, enabling the timely incorporation of findings, recommendations and lessons learned into the decision-making processes at organization-wide, programme and project level. ODG/EIO/IED is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

2. PROJECT CONTEXT

Detailed background information of the project can be found the terms of reference (TOR) for the terminal evaluation.

3. DUTIES AND RESPONSIBILITIES

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
1. Review project documentation and relevant country background information (national policies and strategies, UN strategies and general economic data); determine key data to collect in the field and adjust the key data collection instrument if needed	<ul style="list-style-type: none"> Adjust table of evaluation questions, depending on country specific context; Draft list of stakeholders to interview during the field missions 	4 days	Home-based
2. Prepare an inception report which streamlines the specific questions to address the key issues in the TOR, specific methods that will be used	<ul style="list-style-type: none"> Draft theory of change and Evaluation framework to submit to the Evaluation Manager for clearance 	2 days	Home based

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
and data to collect in the field visits, detailed evaluation methodology confirmed, draft theory of change, and tentative agenda for field work.			
3. Briefing with the UNIDO Independent Evaluation Division, project managers and other key stakeholders at UNIDO HQ. Conduct interviews with key selected stakeholders participating in the project through skype, as necessary	<ul style="list-style-type: none"> Detailed evaluation schedule with tentative mission agenda (incl. list of stakeholders to interview and site visits); mission planning; Division of evaluation tasks with the National Consultant. Key feedback from beneficiaries and stakeholders 	1 day 2 days	Vienna, Austria
4. Conduct field mission to the United Republic of Tanzania in 2018 ¹² .	<ul style="list-style-type: none"> Conduct meetings with relevant project stakeholders, beneficiaries, the GEF Operational Focal Point (OFP), etc. for the collection of data and clarifications; Agreement with the National Consultant on the structure and content of the evaluation report and the distribution of writing tasks; Evaluation presentation of the evaluation's preliminary findings, conclusions and recommendations to stakeholders in the country, including the GEF OFP, at the end of the mission. 	7 days	United Republic of Tanzania (specific project sites to be identified later)
5. Present overall findings and recommendations to the stakeholders at UNIDO HQ	<ul style="list-style-type: none"> After field mission(s): Presentation slides, feedback from stakeholders obtained and discussed 	1 days	Vienna, Austria
6. Prepare the evaluation report, with inputs from the National	<ul style="list-style-type: none"> Draft evaluation report. 	6 days	Home-based

¹² The exact mission dates will be decided in agreement with the Consultant, UNIDO HQ, and the country counterparts.

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
Consultant, according to the TOR; Coordinate the inputs from the National Consultant and combine with her/his own inputs into the draft evaluation report. Share the evaluation report with UNIDO HQ and national stakeholders for feedback and comments.			
7. Revise the draft project evaluation report based on comments from UNIDO Independent Evaluation Division and stakeholders and edit the language and form of the final version according to UNIDO standards.	• Final evaluation report.	1 days	Home-based
TOTAL		24 days	

REQUIRED COMPETENCIES

Core values:

1. Integrity
2. Professionalism
3. Respect for diversity

Core competencies:

1. Results orientation and accountability
2. Planning and organizing
3. Communication and trust
4. Team orientation
5. Client orientation
6. Organizational development and innovation

Managerial competencies (as applicable):

1. Strategy and direction
2. Managing people and performance
3. Judgement and decision making
4. Conflict resolution

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education:

Advanced degree in environment, energy, engineering, development studies or related areas

Technical and functional experience:

- Minimum of 15 years' experience in environmental/energy project management and/or evaluation (of development projects)
- Knowledge about GEF operational programs and strategies and about relevant GEF policies such as those on project life cycle, M&E, incremental costs, and fiduciary standards

- Experience in the evaluation of GEF projects and knowledge of UNIDO activities an asset
- Knowledge about multilateral technical cooperation and the UN, international development priorities and frameworks
- Working experience in developing countries

Languages:

Fluency in written and spoken English is required.

All reports and related documents must be in English and presented in electronic format.

Absence of conflict of interest:

According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the UNIDO Independent Evaluation Division.



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	National evaluation consultant
Main Duty Station and Location:	Home-based
Mission/s to:	Travel to potential sites within United Republic of Tanzania
Start of Contract:	May 2018
End of Contract:	July 2018
Number of Working Days:	15 days spread over the above-mentioned period

ORGANIZATIONAL CONTEXT

The UNIDO Independent Evaluation Division is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes. Evaluation is an assessment, as systematic and impartial as possible, of a programme, a project or a theme. Independent evaluations provide evidence-based information that is credible, reliable and useful, enabling the timely incorporation of findings, recommendations and lessons learned into the decision-making processes at organization-wide, programme and project level. The UNIDO Independent Evaluation Division is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

PROJECT CONTEXT

The national evaluation consultant will evaluate the projects according to the terms of reference (TOR) under the leadership of the team leader (international evaluation consultant). S/he will perform the following tasks:

MAIN DUTIES	Concrete/measurable outputs to be achieved	Expected duration	Location
Desk review Review and analyze project documentation and relevant country background information; in cooperation with the team leader, determine key data to collect in the field and prepare key instruments in English (questionnaires, logic models); If need be, recommend adjustments to the evaluation framework and Theory of Change in order to ensure their understanding in the local context.	Evaluation questions, questionnaires/interview guide, logic models adjusted to ensure understanding in the national context; A stakeholder mapping, in coordination with the project team.	3 days	Home-based
Coordinate the evaluation mission agenda, ensuring and setting up the required meetings with project partners and government counterparts, and organize	<ul style="list-style-type: none"> • Detailed evaluation schedule. • List of stakeholders to 	1 days	Home-based

MAIN DUTIES	Concrete/measurable outputs to be achieved	Expected duration	Location
and lead site visits, in close cooperation with project staff in the field.	interview during the field missions.		
Coordinate and conduct the field mission with the team leader in cooperation with the Project Management Unit, where required; Consult with the Team Leader on the structure and content of the evaluation report and the distribution of writing tasks. Conduct the translation for the Team Leader, when needed.	<ul style="list-style-type: none"> • Presentations of the evaluation's initial findings, draft conclusions and recommendations to stakeholders in the country at the end of the mission. • Agreement with the Team Leader on the structure and content of the evaluation report and the distribution of writing tasks. 	7 days (including travel days)	In United Republic of Tanzania
Prepare inputs and analysis to the evaluation report according to TOR and as agreed with the Team Leader. Revise the draft project evaluation report based on comments from UNIDO Independent Evaluation Division and stakeholders and proof read the final version.	Draft evaluation report prepared.	4 days	Home-based
TOTAL		15 days	

REQUIRED COMPETENCIES

Core values:

1. Integrity
2. Professionalism
3. Respect for diversity

Core competencies:

1. Results orientation and accountability
2. Planning and organizing
3. Communication and trust
4. Team orientation
5. Client orientation
6. Organizational development and innovation

Managerial competencies (as applicable):

1. Strategy and direction
2. Managing people and performance
3. Judgement and decision making
4. Conflict resolution

α. MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: Advanced university degree in environmental science, engineering or other relevant discipline like developmental studies with a specialization in industrial energy efficiency and/or climate change.

Technical and functional experience:

- Exposure to the needs, conditions and problems in developing countries.
- Familiarity with the institutional context of the project is desirable.
- Experience in the field of environment and energy, including evaluation of development cooperation in developing countries is an asset

Languages: Fluency in written and spoken English and Swahili is required.

Absence of conflict of interest:

According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the UNIDO Independent Evaluation Division.

D. Annex 4- Outline of an in-depth project evaluation report

Executive summary (maximum 5 pages)

- Evaluation purpose and methodology
- Key findings
- Conclusions and recommendations
- Project ratings
- Tabular overview of key findings – conclusions – recommendations

1. Introduction

- 1.1. Evaluation objectives and scope
- 1.2. Overview of the Project Context
- 1.3. Overview of the Project
- 1.4. Theory of Change
- 1.5. Evaluation Methodology
- 1.6. Limitations of the Evaluation

2. Project's contribution to Development Results - Effectiveness and Impact

- 2.1. Project's achieved results and overall effectiveness
- 2.2. Progress towards impact
 - 2.2.1. Behavioural change
 - 2.2.1.1. Economically competitive - Advancing economic competitiveness
 - 2.2.1.2. Environmentally sound – Safeguarding environment
 - 2.2.1.3. Socially inclusive – Creating shared prosperity
 - 2.2.2. Broader adoption
 - 2.2.2.1. Mainstreaming
 - 2.2.2.2. Replication
 - 2.2.2.3. Scaling-up

3. Project's quality and performance

- 3.1. Design
- 3.2. Relevance
- 3.3. Efficiency
- 3.4. Sustainability
- 3.5. Gender mainstreaming

4. Performance of Partners

- 4.1. UNIDO
- 4.2. National counterparts
- 4.3. Donor

5. Factors facilitating or limiting the achievement of results

- 5.1. Monitoring & evaluation
- 5.2. Results-Based Management
- 5.3. Other factors
- 5.4. Overarching assessment and rating table

6. Conclusions, recommendations and lessons learned

- 6.1. Conclusions
- 6.2. Recommendations
- 6.3. Lessons learned

6.4. Good practices

Annexes (to be put online separately later)

- Evaluation Terms of Reference
- Evaluation framework
- List of documentation reviewed
- List of stakeholders consulted
- Project log frame/Theory of Change
- Primary data collection instruments: evaluation survey/questionnaire
- Statistical data from evaluation survey/questionnaire analysis

E. Annex 5: Checklist on evaluation report quality

Project Title:

UNIDO ID:

Evaluation team:

Quality review done by:

Date:

Report quality criteria	UNIDO Independent Evaluation Division assessment notes	Rating
a. Was the report well-structured and properly written? (Clear language, correct grammar, clear and logical structure)		
b. Was the evaluation objective clearly stated and the methodology appropriately defined?		
c. Did the report present an assessment of relevant outcomes and achievement of project objectives?		
d. Was the report consistent with the ToR and was the evidence complete and convincing?		
e. Did the report present a sound assessment of sustainability of outcomes or did it explain why this is not (yet) possible? (Including assessment of assumptions, risks and impact drivers)		
f. Did the evidence presented support the lessons and recommendations? Are these directly based on findings?		
g. Did the report include the actual project costs (total, per activity, per source)?		
h. Did the report include an assessment of the quality of both the M&E plan at entry and the system used during the implementation? Was the M&E sufficiently budgeted for during preparation and properly funded during implementation?		
i. Quality of the lessons: were lessons readily applicable in other contexts? Did they suggest prescriptive action?		
j. Quality of the recommendations: did recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?'). Can these be immediately implemented with current resources?		
k. Are the main cross-cutting issues, such as gender, human rights and environment, appropriately covered?		
l. Was the report delivered in a timely manner? (Observance of deadlines)		

Rating system for quality of evaluation reports

A rating scale of 1-6 is used for each criterion: Highly satisfactory = 6, Satisfactory = 5, Moderately satisfactory = 4, Moderately unsatisfactory = 3, Unsatisfactory = 2, Highly unsatisfactory = 1, and unable to assess = 0.

F. Annex 6: Guidance on integrating gender in evaluations of UNIDO projects and Projects

A. Introduction

Gender equality is internationally recognized as a goal of development and is fundamental to sustainable growth and poverty reduction. The UNIDO Policy on gender equality and the empowerment of women and its addendum, issued respectively in April 2009 and May 2010 (UNIDO/DGB(M).110 and UNIDO/DGB(M).110/Add.1), provides the overall guidelines for establishing a gender mainstreaming strategy and action plans to guide the process of addressing gender issues in the Organization's industrial development interventions.

According to the UNIDO Policy on gender equality and the empowerment of women:

Gender equality refers to the equal rights, responsibilities and opportunities of women and men and girls and boys. Equality does not suggest that women and men become 'the same' but that women's and men's rights, responsibilities and opportunities do not depend on whether they are born male or female. Gender equality implies that the interests, needs and priorities of both women and men are taken into consideration, recognizing the diversity of different groups of women and men. It is therefore not a 'women's issues'. On the contrary, it concerns and should fully engage both men and women and is a precondition for, and an indicator of sustainable people-centered development.

Empowerment of women signifies women gaining power and control over their own lives. It involves awareness-raising, building of self-confidence, expansion of choices, increased access to and control over resources and actions to transform the structures and institutions which reinforce and perpetuate gender discriminations and inequality.

Gender parity signifies equal numbers of men and women at all levels of an institution or organization, particularly at senior and decision-making levels.

The UNIDO projects/projects can be divided into two categories: 1) those where promotion of gender equality is one of the key aspects of the project/project; and 2) those where there is limited or no attempted integration of gender. Evaluation managers/evaluators should select relevant questions depending on the type of interventions.

B. Gender responsive evaluation questions

The questions below will help evaluation managers/evaluators to mainstream gender issues in their evaluations.

B.1. Design

- Is the project/project in line with the UNIDO and national policies on gender equality and the empowerment of women?
- Were gender issues identified at the design stage?
- Did the project/project design adequately consider the gender dimensions in its interventions? If so, how?
- Were adequate resources (e.g., funds, staff time, methodology, experts) allocated to address gender concerns?
- To what extent were the needs and priorities of women, girls, boys and men reflected in the design?
- Was a gender analysis included in a baseline study or needs assessment (if any)?
- If the project/project is people-centred, were target beneficiaries clearly identified and disaggregated by sex, age, race, ethnicity and socio-economic group?

- If the project/project promotes gender equality and/or women's empowerment, was gender equality reflected in its objective/s? To what extent are output/outcome indicators gender disaggregated?

B.2. Implementation management

- Did project monitoring and self-evaluation collect and analyse gender disaggregated data?
- Were decisions and recommendations based on the analyses? If so, how?
- Were gender concerns reflected in the criteria to select beneficiaries? If so, how?
- How gender-balanced was the composition of the project management team, the Steering Committee, experts and consultants and the beneficiaries?
- If the project/project promotes gender equality and/or women's empowerment, did the project/project monitor, assess and report on its gender related objective/s?

B.3. Results

- Have women and men benefited equally from the project's interventions? Do the results affect women and men differently? If so, why and how? How are the results likely to affect gender relations (e.g., division of labour, decision making authority)?
- In the case of a project/project with gender related objective/s, to what extent has the project/project achieved the objective/s? To what extent has the project/project reduced gender disparities and enhanced women's empowerment?

ANNEX 2: List of documents reviewed

Here, only unique documents are listed. If the documents are part of a series (e.g. regular monthly or annual reports, only the document category is mentioned).

- UNIDO GEF Project Document for “Mini-grids based on small hydropower sources to augment rural electrification in Tanzania, 2011
- Techno-economic studies for demonstration schemes
- Mission Report: MHP Salala Commissioning: Follow up Technology Transfer Project
- Brochure - Small Hydropower MiniGrids for Rural Electrification in Tanzania
- Booklet - Small Hydro Power Projects Enabling an energy revolution in Tanzania
- Annual Monitoring Reports
- Monthly Project Monitoring reports
- Mid Term Evaluation Report, 2015
- Meeting minutes from Project Steering Committee (PSC) meetings
- Back to Office Mission Reports (BTOMR)
- Case Studies on Kiliflora, Salala, Mbangamao (Andoya) and Ifumbo demonstration schemes
- UNIDO Guide on Gender Mainstreaming – Energy and Climate Change Projects (2014)
- GEF Guidelines on the Project and Program Cycle Policy, 2017
- UNIDO Evaluation Manual, 2018

ANNEX 3: Mission itinerary and list of stakeholders consulted

UNIDO Terminal Evaluation – Individual Met during the Field Visit (August 2018)

Date	Site	Location	Individuals Met	Role
6 August 2018	Kiliflora flower farm - Makumira	Arusha	Jerry Goh	Executive Director
			Anil Jondhale	Farm Manager
6 August 2018	Makumira	Arusha	Justin Mungire	Technician; installed the SHP at Arusha National Park
9 August 2018	Ifumbo (Mbingu Sisters)	Ifakara, Morogoro)	Sr. Senorina Lukwachala	Assistant Mother General
			Mr. Charles Mbata	Power House Operator and Management of the reservoir
			Ernest Makali	Power House Operator and Management of the reservoir
10 August 2018		Njombe		
11 August 2018	Salala – Sonji Mission (Ludilu Village)	Makete District, Njombe Region	Charles Tave	Operator and shareholder – 10%
			Wema Vilimbila	Electrician (female)
			Eliot Ndelwa	Secretary to the Project (Ludilu Parish)
			Ayubu Michael Lwilla	Project Coordinator
13 August 2018	Mbangamao (AHEPO)	Mbinga, Ruvuma	Mr. Alex Andoya	Managing Director
			Mrs. Janeth Andoya	Owner Director
			Mr. Jasper Buberwa	Plant Engineer
			Mr. Mathias Mhagama	Operator

Date	Site	Location	Individuals Met	Role
			Mr. John Haule	Accountant
			John Ndunguru at Lifakara Village	Entrepreneur
			Mrs. Elizabeth at Lifakara Village Ndunguru	Entrepreneur
17 August 2018	Ministry of Energy and Minerals	Dodoma	Emilian Nyanda	Snr. Energy Officer (RE Section), Dept of Electricity and RE, Min of Energy
16 August 2018	Vice President Office - DoE	Dar es Salaam	Fainahappy Kimambo	GEF Desk officer
17 August 2018	University of Dar es Salaam Minihydro Centre	Dar es Salaam	Wakati Ramadhan	CoET Coordinator
17 August 2018	UNCDF	Dar es Salaam	Mr. Imanuel Muro	Senior Finance Specialist
20 August 2018	Rural Energy Agency (REA)	Dar Es Salaam	Emmanuel Yessaya	Act. Project Identification & Promotion Manager

ANNEX 4: Project results framework

Project Strategy		Objectively Verifiable Indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
Goal	To reduce GHG emissions related to the use of carbon intensive energy sources in rural areas in Tanzania.	<p>1. Percentage increment in use of micro / mini hydropower-based electricity by rural population.</p> <p>2. Percentage Increment in CO₂e emission reductions (t CO₂e).</p>	<p>1. Only 2% of rural population has access to grid electricity.</p> <p>2. CO₂ emission due to diesel based local power generation.</p>	A cumulative of 3.2 MW micro / mini hydropower based mini-grids installed during the project duration (2011-2015).	<p>1. Physical verification of the projects in operation.</p> <p>2. End of project M&E report.</p>	<p>1. Continuous support of relevant government departments and private investors are in place.</p> <p>2. Policies are in place.</p>
Objective of the project	To promote micro / mini hydropower based mini grids in Tanzania to augment rural electrification.	<p>1. Number of MWs of micro / mini hydropower based mini-grids in operational.</p> <p>2. Number of locally fabricated micro / mini hydropower equipment and accessories.</p> <p>3. Number of institutions and entrepreneurs</p>	<p>1. Only 2% of rural population has access to grid electricity.</p> <p>2. No local fabricators available for micro / mini hydropower equipment.</p> <p>3. Lack of technical capacity (human</p>	<p>1. 3.2 MW (cumulative capacity) of micro / mini hydropower plants with mini-grids established.</p> <p>2. At least 5 institutions and 5 entrepreneurs available for developing micro / mini hydropower plants.</p>	<p>1. Physical verification of the implemented projects.</p> <p>2. Physical verification of the fabrication units.</p> <p>3. Published FIT rates for micro / mini hydropower mini-grids.</p>	<p>1. Sustained support of the Government (through different policies), REA, all project participants and project investors.</p> <p>2. Interested local fabricators available.</p>

Project Strategy		Objectively Verifiable Indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
		available for developing micro / mini hydropower plants. 4. FiT for RE including small/micro / mini hydropower plants in place.	and institutional). 4. Weak policy and regulatory regime.	3. FiT for RE including small/micro / mini hydropower plants established.		
Outcome 1	Site specific details on potential micro / mini hydropower sites available for further development.	1. Detailed techno-economic feasibility studies for the identified 9 demonstration sites.	1. Lack of detailed studies for the demonstration sites.	1. Feasibility studies of identified demonstration sites developed.	1. Feasibility study reports.	Continuous support of Government agencies, national utility and the private sector.
Project Component 1: Techno-economic feasibility studies for the identified demonstration sites						
Output 1.1	Detailed feasibility studies and plant designs prepared for the demonstrations in the identified potential sites.	Number of feasibility reports of the demonstration sites (cumulative 3.2 MW).	No feasibility studies exist for the micro / mini hydropower plants development.	To undertake feasibility studies of demonstration sites.	9 feasibility study reports including plant designs for the demonstration sites.	Sustained private and Government support upon agreed project activities.
Outcome 2	Investment cost of micro / mini hydropower based mini-grids reduced because of the local availability of	1. Number of trained local planners and experts on micro / mini hydropower based mini-grids.	1. No sufficient local knowledge exists on developing, implementing and managing	1. To strengthen the capacity of at least 100 persons from CoET, experts, planners and other relevant	1. Number of trained persons. 2. Number of institutions capable of	1. Sustained private, institution and Government support upon agreed project

Project Strategy		Objectively Verifiable Indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
	technical experts and high-quality indigenous hydropower equipment.	<p>2. Number of institutions capable of guiding and supporting micro / mini hydropower plant development in future.</p> <p>3. Number of micro / mini hydropower turbines and controls systems manufacturing facilities operating in the country.</p>	<p>the micro / mini hydropower projects.</p> <p>2. Inadequate institutional capacity exists in the country.</p> <p>3. Micro / mini hydropower turbines and control systems are imported.</p>	<p>stakeholders to support micro / mini hydropower mini-grids development in the country.</p> <p>2. To build capacity of TANESCO and River Basin Authorities in developing and managing micro / mini hydropower systems.</p> <p>3. To transfer technology for facilitating local fabrication of micro / mini hydropower plant equipment to at least 5 interested suppliers.</p>	<p>guiding and supporting micro / mini hydropower plant.</p> <p>3. Physical verification of operating personnel in the power plant.</p> <p>4. Training materials.</p> <p>5. Training evaluation report.</p> <p>6. Number of trained fabricators.</p> <p>7. Physical verification of the manufacturing facilities.</p>	<p>activities.</p> <p>2. Interest of local fabricators.</p>
Project Component 2: Capacity building of stakeholders in developing micro / mini hydropower based mini-grids						
Output 2.1	National micro / mini hydropower technical centre	Approval received and Centre operating.	Insufficient technical capacity exists in	To establish the centre, strengthen it with trained	1. Physical verification.	Continuous support of the participating

Project Strategy		Objectively Verifiable Indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
	established at CoET, UDSM to provide technical support for various technical institutions in Tanzania.		various institutions on micro / mini hydropower systems.	personnel and equip with necessary tools and systems for micro / mini hydropower plant development.	2. Government reports. 3. End of project M&E report.	technical institutions, private sector and Government of Tanzania.
Output 2.2	Technology transferred for local fabrication of micro / mini hydropower equipment.	1. Number of local fabricators trained and licensed in manufacturing of micro / mini hydropower equipment. 2. Number of locally fabricated turbines used in at least 2 installations of the project.	All hydropower equipment imported.	1. To transfer and adapt micro / mini hydro turbine technology to Tanzania. 2. To train at least 5 interested suppliers.	1. No. of trained fabricators 2. License certificates 3. Training evaluation report 4. No. of trained persons 5. Physical verification	Interest of local fabricators and investors.
Output 2.3	Existing guidelines and standards adapted to suit installation and management of micro / mini hydropower plant mini-grids in Tanzania.	Existing guidelines and standards adapted to suit the micro / mini hydropower development, installation and commissioning in Tanzania	No guidelines and standards exist for micro / mini hydropower installation and management. Current focus is on large hydropower plants only.	To prepare and disseminate guidelines and standards on installation and management of micro / mini hydropower mini-grid projects.	1. Guidelines on project development, installation and commissioning. 2. Government reports.	Continuous support of Government, close collaboration of TANESCO and TBS.

Project Strategy		Objectively Verifiable Indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
Output 2.4	Feed-in tariff for micro / mini hydropower in place.	Feed-in-tariff system favouring RE including micro / mini hydropower market available.	No market-based systems favouring RE including micro / mini hydropower exists in the country.	To facilitate introduction of feed-in-tariff for micro / mini hydropower systems	Communiqué of regulatory authority.	Sustained collaboration among Government, micro / mini hydropower training centre, relevant institutions and private stakeholders.
Outcome 3	Interest in developing micro / mini hydropower projects increased among the local entrepreneurs.	1. Number of micro / mini hydropower plants developed and invested by local entrepreneurs.	1. Low interest from private entrepreneurs to engage in micro / mini hydropower development.	1. To create interest among investors and entrepreneurs in micro / mini hydropower projects of at least 24 MW capacity	1. Number of investors. 2. Business models developed. 3. Physical verification of the operating power plants	Interest of local entrepreneurs.
Project Component 3: Developing viable business models for micro / mini hydropower based mini-grid						
Output 3.1	Existing financing options of REA streamlined to benefit local entrepreneurs interested in micro /	Percentage increase in engagement of local entrepreneurs to develop micro / mini hydropower projects.	Low interest from private entrepreneurs to engage in micro / mini hydropower project	At least 10 private sector initiatives facilitated for micro / mini hydropower based mini-grids.	1. Project progress reports. 2. End of Project survey.	Sustained support of Government and the private stakeholders.

Project Strategy		Objectively Verifiable Indicators				
		Indicator (quantified and time-bound)	Baseline	Target	Source of verification	Risks and assumptions
	mini hydropower.		development.			
Outcome 4	Technical and economic viability of micro / mini hydropower technologies demonstrated.	1. Number of rural households with access to electricity. 2. Number of micro / mini hydropower plants in operation.	Only around 2% of the rural population has access to grid electricity.	To establish at least 3.2 MW (cumulative) capacity of micro / mini hydropower based mini-grids in rural areas.	1. Physical verification. 2. Report of commissioning.	Sustained support of Government and private stakeholders.
Project Component 4: Demonstration of micro / mini hydropower plant based mini-grids						
Output 4.1	3.2 MW implemented in different locations within the country.	Micro / mini hydropower power plants established and running in different sites of Tanzania.	Currently only 5 MW of the potential 250 MW micro / mini hydropower exist.	To develop micro / mini hydropower plants within the capacity ranging from 98 kW – 1MW in selected sites.	1. Physical verification of the implemented projects. 2. Performance monitoring report 3. Site visit / seminar. 4. Seminar material, leaflets, various publications and website.	1. Sustained support of the Government. 2. Sustained investor support to visit the project while in operation and data collection.

ANNEX 5: Primary data collection instruments

Questionnaire was one of the methods of data collection during the evaluation. Two different types of questionnaire were developed for use for stakeholder consultation during the mission to Tanzania. One was prepared for visits to the demonstration sites, and the other was for the rest of the stakeholders, including project partners. Some of the questionnaire were prepared for specific to each stakeholder.

These two types of questionnaire are shown below.

Questionnaire for Field visits Common questions /Cross cutting for ALL sites

1. Registration status (when and type)
2. Management issues (Management team, Board, Structure, Regular meetings, etc.)
3. Number of staff (part-time and full time) – disaggregate by gender
4. Technical team to operate the plant and their respective qualifications (how many and qualifications)
5. What is your view on the general availability of technical experts and high-quality indigenous hydropower equipment in Tanzania? (Available or not available?)
 - a. How has this impacted (negatively/positively) the investment costs by the project/mini-hydro plant?
 - b. Have you accessed the services of the Centre for Mini/micro Hydro in Tanzania at CoET UDSM?
6. If you had the resources to scale up this project, would you be interested in developing another micro / mini hydropower project in another site? Explain your response.
7. What difference has the project made to the general status of the beneficiaries?
 - a. What was the source of power before the installation of the plant?
 - b. Also take note of the changes in the economic performance of beneficiaries (e.g. finances, income, costs saving, expenditure) of individuals, groups and entities.
 - c. Contribution to changes in capacity and capability of individuals, groups and entities in society, such as employment, education, and training.
8. Refer the 'Impact Reporting Framework': How do you keep track of your beneficiaries (number of people and enterprises benefiting from the project/site and respective benefits – capacity installed and generated, people trained, etc.)? CHECK EVIDENCE OF DATA, IF RELEVANT
9. What lessons have you learnt/experienced from the project – the whole Project Cycle (what was the situation, what did you do and what is the current status)?
10. What aspects of the project have you adopted in your project/institution and how are you planning to sustain these aspects?

11. To what extent do you attach these changes to the UNIDO Project?
12. Any challenges encountered from the project cycle (design, implementation, management, monitoring, reporting, communication and sharing)?
13. Are there any anticipated risks that would hinder the sustainability of the project? (e.g. financial, social, political, institutional, environmental)?
14. What needs of benefiting individuals and enterprises do the project address?
15. How do you track these needs?
16. What are the reasons for the achievement/non-achievement of the project objectives?
 - o Factors of success or failure??
17. To what extent is the identified progress result of the project rather than external factors?
 - o Would you achieve the results of the project without the support of the UNIDO project? Explain.
18. What can be done to make the project more effective?
19. Who are your target groups/beneficiaries?
20. Were the expected results achieved within the original budget? If no, please explain why.
21. What measures have been taken during planning and implementation to ensure that resources are efficiently used? Were the project expenditures in line with budgets? Did you develop technical and financial reports for UNIDO/donor?
22. what and how much of co-financing was achieved – include estimate of total amount invested (both cash and in-kind) -
 - o To what extent did the expected co-financing materialize, in cash or in-kind, grants or loan? Was co-financing administered by the project management or by some other organization? Did short fall in co-financing or materialization of greater than expected co-financing affected project results?
23. Could more have been achieved with the same input?
24. Could the same have been achieved with less input?
25. How timely was the project in producing outputs and outcomes? Comment on the delay or acceleration of the project's implementation period.
26. Did you develop annual workplans and budgets with the donor/UNIDO? To what extent were the project's activities in line with the schedule of activities as defined by the Project Team and annual Work Plans?
27. Have the inputs from the donor/UNIDO and/or support by the Government/counterpart been provided as planned, and were they adequate to meet the requirements of the project?
28. Will the project results and benefits be sustained after the end of donor funding? Explain

29. Do you have an exit strategy?
30. Financial risks:
- o What are your plans to ensure sustainability of financial and economic resources once the project ends?
31. Socio-political risks:
- o Are there any social or political risks that may jeopardize the sustainability of project outcomes?
 - o How do you promote/market your services to the public/stakeholder in support of the project's long-term objectives?
32. Institutional framework and governance risks:
- o What systems are in place to ensure accountability, transparency and continued technical know-how of the management and staff?
33. Environmental risks:
- o Seasonality of the river
 - Upstream activities, if any?
 - Other environmental issues?
34. Social issues:
- o Human activities threatening the project
 - o Social benefits of the project (education, agriculture, etc.)
35. Economic issues
- o Available and potential clients Vs Capacity of the plant (CHECK THE IMPACT MODEL and compare)
 - o What is your view on the economic viability of micro/mini hydropower technologies in Tanzania (focusing on your business case)? Are you able to reach breakeven point?
36. Gender Mainstreaming
- Do the results of the project affect women and men differently? If so, why and how? How are the results likely to affect gender relations (e.g., division of labour, decision-making authority)?

Questionnaire for Stakeholders

College of Engineering and Technology (CoET): UDSM Hydro Centre

1. What services are provided by the Centre so far? How these are attributable to the UNIDO project?
2. UDSM Staff supporting the Centre [number (by gender), qualifications, terms]
3. Type of stakeholders accessing the Centre?
4. Database of beneficiaries so far?
5. What human and institutional capacity building trainings in micro/mini hydro have been conducted by the Centre?

6. How many people are trained?
7. Any training materials that have been prepared targeting different stakeholders?
8. What lessons have you learnt/experienced from the project – the whole Project Cycle (what was the situation, what did you do and what is the current status)?
9. Are there any laws, policies, regulations or projects that have been improved/developed as a result of the implementation or lessons from the UNIDO project?
10. How do you attach these changes to the UNIDO Project?
11. Any challenges encountered from the project cycle (design, implementation, management, monitoring, reporting, communication and sharing)?
12. What are the reasons for the achievement/non-achievement of the project objectives?
 - a. Factors of success or failure??
13. To what extent is the identified progress result of the project rather than external factors?
 - a. Would you achieve the results of the project without the support of the UNIDO project? Explain.
14. What can be done to make the project more effective?
15. Who are your target groups / beneficiaries?
16. Co-financing: what and how much – include estimate of total amount invested (both cash and in-kind) -
 - a. To what extent did the expected co-financing materialize, in cash or in-kind, grants or loan? Was co-financing administered by the project management or by some other organization? Did short fall in co-financing or materialization of greater than expected co-financing affected project results?
17. What are sustainability aspects of the Centre - (technical and financial): would there be operations without UNIDO/support by the project? What are your plans to ensure sustainability once the project ends?
18. Do you have an exit strategy to sustain the Centre after the end of donor funding?
19. How do you promote/market your services to the public/stakeholders in support of the project's long-term objectives?
20. What systems are in place to ensure accountability, transparency and continued technical know-how of the management and staff?

Ministry of Energy

1. What has changed/improved over years (2012 – 2018) /a period of five years in the electricity sector in Tanzania?
2. What efforts does the government put in place to ensure increased electricity coverage and access in Tanzania?

3. What strategies are in place to embrace and support private investors in the electricity sector – like the ones UNIDO is supporting?
4. What is the status of the FiT for RE projects in Tanzania? Has it been established? How many projects have taken advantage of the FIT if it's already in place.
5. If done, any campaigns/efforts by the government of Tanzania to ensure public awareness?
6. What are lessons have been experienced from the project – the whole Project Cycle (what was the situation, what did you do and what is the current status)?
7. Are there any laws, policies, regulations or strategies that have been improved/developed due to lessons from the implementation or lessons from the UNIDO project?
8. How do you attach these changes to the UNIDO Project?
9. Any challenges encountered from the project cycle (design, implementation, management, monitoring, reporting, communication and sharing)?

Rural Energy Agency (REA)

1. Have you streamlined financing options for micro/mini hydro projects in Tanzania?
2. What are lessons have been experienced from the project – the whole Project Cycle (what was the situation, what did you do and what is the current status)?
3. Are there any laws, policies, regulations or strategies that have been improved/developed due to lessons from the implementation or lessons from the UNIDO project?
4. Any challenges encountered from the project cycle (design, implementation, management, monitoring, reporting, communication and sharing)?
5. What are the reasons for the achievement/non-achievement of the project objectives?
6. To what extent is the identified progress result of the project rather than external factors?
7. Would you achieve the results of the project without the support of the UNIDO project? Explain.
8. What can be done to make the project more effective?
9. What has changed/improved over years (2012 – 2018) /a period of five years in the electricity sector in Tanzania?
10. What efforts does the government put in place to ensure increased electricity coverage and access in Tanzania?
11. What strategies are in place to embrace and support private investors in the electricity sector – like the ones UNIDO is supporting?
12. What is the status of the FiT for RE projects in Tanzania? Has it been established? How many projects have taken advantage of the FIT if it's already in place?
13. If done, any campaigns/efforts by the government of Tanzania to ensure public awareness?

14. What are lessons have been experienced from the project – the whole Project Cycle (what was the situation, what did you do and what is the current status)?

15. Are there any laws, policies, regulations or strategies that have been improved/developed due to lessons from the implementation or lessons from the UNIDO project?

16. How do you attach these changes to the UNIDO Project?

17. Any challenges encountered from the project cycle (design, implementation, management, monitoring, reporting, communication and sharing)?

GEF Focal point

1. How do you monitor progress?

2. What is your view about sustainability of the UNIDO project?

3. How effective do you think the project has been?

4. What changes you would like to see?

5. What is the prospect for hydropower?

6. Do you have a gender strategy and gender goal?

7. How do you ensure gender mainstreaming in the projects?

8. How did you ensure linkage between suppliers and investors and ensure timely implementation of the projects?

9. What lessons have you experienced from the project – the whole Project Cycle (what was the situation, what did you do and what is the current status)?

10. Any challenges encountered from the project cycle (design, implementation, management, monitoring, reporting, communication and sharing)?

11. How does the project verify data/reports by project developers? Are sources of verification available to justify project results (outputs, outcomes and impacts)?

12. What processes are in place to ensure learning and sharing practices in the project or within the organisation?

13. Is there an individual/team responsible for Monitoring, Evaluation and Learning processes?

14. Which national development priorities (e.g. national poverty reduction strategy, sector development strategy) is the project aligned to?

15. How is the project aligned to donor priorities, policies and strategies?

16. How is the project aligned to UNIDO's priorities/strategy?

17. What needs of the target group do the project address? Have these changed over years since the beginning of the project? If they have changed, what influenced this change? How has the project adapted due to this change? (eg change in objectives/approach, etc)

18. What are the reasons for the achievement/non-achievement of the project objectives?

19. What is the composition of women in the project team, steering committee and beneficiaries?

20. Do the results affect women and men differently? If so, why and how? How are the results likely to affect gender relations (e.g., division of labour, decision-making authority)?