

Scientific and Technical Advisory Panel

The Scientific and Technical Advisory Panel, administered by UNEP, advises the Global Environment Facility
(Version 5)

STAP Scientific and Technical screening of the Project Identification Form (PIF)

Date of screening: May 09, 2013

Screeners: Lev Neretin

Panel member validation by: Ralph E. Sims; Annette Cowie
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I. PIF Information *(Copied from the PIF)*

FULL SIZE PROJECT GEF TRUST FUND

GEF PROJECT ID: 5334

PROJECT DURATION : 5

COUNTRIES : Sao Tome and Principe

PROJECT TITLE: Promotion of Environmentally Sustainable and Climate-Resilient Grid-based Hydroelectric Electricity through an Integrated Approach in Sao Tome and Principe

GEF AGENCIES: UNDP

OTHER EXECUTING PARTNERS: Ministry of Energy and Natural

Resources (MENR), Empresa da
Agua e Electricidade (EMAE – water
and electricity company), Central

Bank of Sao Tome and Principe

GEF FOCAL AREA: Multi Focal Area

II. STAP Advisory Response *(see table below for explanation)*

Based on this PIF screening, STAP's advisory response to the GEF Secretariat and GEF Agency(ies): **Minor revision required**

III. Further guidance from STAP

STAP acknowledges the receipt of this project proposal in Sao Tome and Principe that has a goal to introduce an integrated energy and ecosystem-based approach to grid –based hydroelectric electricity generation. The integrated approach is exercised through combination of the three project component, two of which focus on enabling environment for energy investment and one component focuses on mitigation of degradation of agro-systems and forest ecosystems.

The project is "unusual" by combining resources of different focal areas to support integrated development of hydropower resources in Sao Tome and Principe. The related issues of biodiversity, land use, water and forest degradation are made clear and the link with reforestation is commendable. This integrated energy and ecosystem based approach to "pioneer a new paradigm for sustainable development of mini-hydroelectric plants in ecologically vulnerable landscapes in SIDS" makes good sense.

Past hydropower GEF projects were designed to remove key market, policy, technical, and financial barriers to micro-hydro development and utilization, and complements the ongoing and planned renewable energy and rural electrification initiatives of the government and private sector. Analysis of the barriers 1 and 2 in the proposal shows that the project intends to tackle policy, market, technical, and financial barriers to comply with the Focal Area Climate Change Objective 3 (CCM-3: Renewable Energy: Promote investment in renewable energy technologies). However, the proposal lacks the analysis on the dynamic baseline for future energy grid composition and subsequent GHG emissions. Do the activities in the proposed project intend to reduce the reliance on the imported fossil fuels? Therefore, STAP questions the GEF incremental support to CCM-3 activities of the proposal that lacks a statement on dynamic baseline projections.

In addition, Table 2 "Project Activities and Incremental Reasoning" lacks linkages to Project Framework with regard to Global Environmental Benefits (GEBs). The electricity supplied to the grid by itself does not bring GEBs in CO2 emission reductions; replacement of fossils fuels in the grid brings about direct emission reductions and proper policies bring indirect reductions. Please provide clarifications on what parameters went into CO2 calculation. The table also does not mention integrated forestry/watershed management master plan and environmental safeguards for on-grid

mini-hydro, which would seem to be the reason for the incremental GEF support. Does it mean that these outputs are supported by co-financing and not the GEF?

As we understand, the activities under Component 3 ("Watershed and Sustainable Forestry Management and Implementation") will address the identified Barrier 3 and Focal Area Objectives LD-3 (Reduce pressures on natural resources from competing land uses in the wider landscape) and SFM-1 (Reduce pressures on forest resources and generate sustainable flows of forest ecosystem services). STAP understands that PPG phase will bring clarification on the most optimal conservation farming and fire management techniques and wishes to suggest minor revisions on this component:

1. Change the title of the component so that it reflects land management.
2. Spell out forest ecosystem services that will be managed and how this will be achieved.
3. Consider adding a capacity building component as outlined in Barrier 3.
4. Consider revising GEBs under Component 3. It is unclear whether rehabilitation of 3,000 ha of secondary forest will be done to offset the impact of the earthworks. Please identify GEB for LD component in carbon stocks additions. Project managers could benefit from using Carbon Benefits Project tools for estimating carbon benefits. The tool can be found here <http://www.unep.org/climatechange/carbon-benefits/About/tabid/3539/Default.aspx>
5. What does stabilization of 20% of all forest buffer zones mean? The description of this activity is lacking.

STAP recognizes that the project focuses on mini-hydro. However, STP also has potential to develop solar, wind and bio-power generation. The latter is particularly relevant as unsustainable biomass (fuelwood and charcoal) harvesting is an important driving factor of deforestation in the country.

In designing project component on policy, institutional and legal framework for on-grid mini-hydropower, STAP recommends exploring policy, institutional and legal assistance to support other forms of RET. STP is facing substantial challenges of energy access and projects should start to build on ground work for other RETs having in mind longer-term prospects and future access to energy as demand increases.

Support for integrated watershed management plans is a welcome initiative to ensure ecosystem-based management. Does the country have a legal and institutional framework for IWRM? If not, how will the project support water governance reforms beyond those few selected for hydropower watersheds? What is the risk that developed in the project watershed plans will not be implemented without proper national or regional frameworks?

A 2-MW of hydro power plants exist so some experience is already in place. The remaining electricity generation is diesel generation which, if the total demand load is not increasing, will be partly displaced.

The barriers to greater deployment are clear and well understood. Project interventions are focused largely on initial investment cost barriers to support mini-hydro. Less attention is paid on how to overcome lack of technical capacity for suppliers, installers and financiers; lack of awareness of other RETs; as well as market barriers such as support for feed-in-tariffs and exploring opportunities for carbon financing.

The 4MW of new capacity generating 11913 MWh implies a 34% capacity factor. This seems low for a hydro project unless the hydro is assumed to be used for peak load following and the diesel remains as base load. Some clarification of how the power system will be managed would be useful.

The CO2 reduction potential is calculated using a 34% capacity factor. Is that based on existing hydro plants on the islands? Reducing the capacity factor of diesel generation by running hydro plant more as baseload would provide greater displacement and avoid spilling of much water - that is assumed to be the case at such a low capacity factor for run-of-river schemes.

No indicators or milestones are presented that would enable the success (or otherwise) of the project to be measured.

To strengthen the regional approach to supporting RETs and ensure future sustainability of project efforts, STAP recommends that project proponents consider building links and exchange knowledge and experience with the Centre of Excellence in Renewable Energy and Energy Efficiency in Central Africa (CEREECA) as well as other initiatives being supported by the ARPEDAC - a non-profit association involved in research and promotion of services and technologies related to energy efficiency and renewable energy in the Economic Community of Central Africa - (<http://www.arpedac.org/>).

<i>STAP advisory response</i>	<i>Brief explanation of advisory response and action proposed</i>
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1. Consent	<p>STAP acknowledges that on scientific or technical grounds the concept has merit. However, STAP may state its views on the concept emphasizing any issues where the project could be improved.</p> <p>Follow up: The GEF Agency is invited to approach STAP for advice during the development of the project prior to submission of the final document for CEO endorsement.</p>
2. Minor revision required.	<p>STAP has identified specific scientific or technical challenges, omissions or opportunities that should be addressed by the project proponents during project development.</p> <p>Follow up: One or more options are open to STAP and the GEF Agency:</p> <ul style="list-style-type: none"> (i) GEF Agency should discuss the issues with STAP to clarify them and possible solutions. (ii) In its request for CEO endorsement, the GEF Agency will report on actions taken in response to STAP's recommended actions.
3. Major revision required	<p>STAP has identified significant scientific or technical challenges or omissions in the PIF and recommends significant improvements to project design.</p> <p>Follow-up:</p> <ul style="list-style-type: none"> (i) The Agency should request that the project undergo a STAP review prior to CEO endorsement, at a point in time when the particular scientific or technical issue is sufficiently developed to be reviewed, or as agreed between the Agency and STAP. (ii) In its request for CEO endorsement, the Agency will report on actions taken in response to STAP concerns.