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: October 25, 2013 Screener: Nijavalli H. Ravindranath

Panel member validation by: Ralph E. Sims
Consultant(s):

I. PIF Information *(Copied from the PIF)*
FULL SIZE PROJECT GEF TRUST FUND
GEF PROJECT ID: 5536
PROJECT DURATION : 6
COUNTRIES : Turkmenistan
PROJECT TITLE: Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan
GEF AGENCIES: UNDP
OTHER EXECUTING PARTNERS: Ministry of Water Resources
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

The project aims at an integrated approach to making energy using water management sustainable while reducing GHG emissions and preventing land degradation and improvement of arable land and pastures. This project is submitted as a multi-focal area project to be implemented by Ministry of Water resources.

Overall the project has merit, there are no evident technical or scientific barriers, and it could produce a series of useful outputs that could be replicated elsewhere.
However, the different components of the project do not seem to be synergistic or integrated adequately to make it a genuine multi-focal area project. The project has a great many activities and interventions and (in the Panel's view) far too many stakeholders. It has too many divergent components and activities such as desalinization, micro-irrigation, nutrient management, pasture irrigation, watering points for livestock in desert, drainage improvement, SLM measures, land use planning, energy conservation technologies, wind and solar energy technologies and many policy and regulatory interventions. Furthermore, the project intends to be implemented in three different locations. Combined, these factors suggest that it will be a challenge for any project manager to implement such a complex project. The question to be addressed is - how can it made into a more manageable proposition and better fit within the other programmes and policies already implemented in Turkmenistan?

To strengthen the proposal further, STAP recommends addressing the following observations.

1. There is a need for a better integration of the different components of the proposed project to make it a truly multi-focal area project. A project demonstrating an integrated "Food-Energy" concept will be highly valuable to demonstrate than a "Sustained food production-sustained water and nutrient management-GHG emission reduction/carbon sequestration".

2. It is better to focus on one region and develop real integrated energy-crop management-pasture management-nutrient management-water management interventions. It may be better to focus on Sakar-chaga region where arable land exists and it's possible to implement irrigation, crop management, land reclamation, etc interventions.

3. The project also appears complex and will be very hard to manage. Several projects are already underway â€“ so the question is - where could a GEF project, designed as a manageable contribution to enhance what is already being done, best fit into the overall programme?

4. Integrated energy efficiency-renewable energy systems are casually mentioned. The rationale for selecting both energy efficiency-renewable energy or only energy efficiency or only renewable energy systems need to be developed.

5. Use of solar energy for large scale pumping will be a very expensive option and may make crop production based on such a technology not feasible. It is not clear if the wind energy availability matches the seasonal irrigation requirements.

6. Irrigation of pastures to promote grazing in low rainfall regions may not be a feasible option at all, that too using solar water pumping technology. Lands may not be suitable for irrigation and it will be a very expensive proposition to irrigate pasture lands for grazing.

7. Pasture land management on three small areas totalling~2500 hectares will be too small to make any impact on halting land degradation, since livestock can move in and out of such a small area unless it is fenced.

8. A renewable energy based desalinization facility for irrigation in a desert region will be a very expensive and impractical option.

9. Sustainable water supply will be a challenge in low rainfall regions. Desalinization will be a very expensive proposition for crop production and even more difficult for pasture land.

10. The project managers must conduct some preliminary economic analysis of different technologies and interventions proposed in the project and select only those which can be financially sustainable.

11. A good baseline scenario needs to be developed to assess the current GHG emissions, soil organic carbon status to enable assessment of global environmental benefits.

12. The source of technology for the proposed modern efficient RE-based irrigation systems and renewable energy & energy efficiency systems is not clear. Are such technologies nationally available or will the project involve technology transfer from other countries?

13. The concept of focusing on improved water management and reduced fossil fuel energy inputs (through efficiency and renewable energy substitution) is sound. This should involve demand side use of water â€“ for example, by monitoring soil moisture content and applying only when needed, using innovative irrigators that sense how much water is needed for every square metre (using GPS technology for example- http://www.precisionirrigation.co.nz/en/dealerships/index/?showdetails=true) and continually vary water flows on each irrigator nozzle to suit. Avoiding excessive water use should be the first goal as this then saves water, energy and GHG emissions.

14. Some of the water sources are in the mountains, yet hydro-power is not mentioned. Many examples exist of combining water for electricity generation and for irrigation. Even low-head turbines can be used on water channels to power water pumps (http://www.irrigationnz.co.nz/assets/Uploads/poster-small-Graeme-Martin.pdf). This can be far cheaper than solar PV.

15. Having three demonstrations to represent the coast, desert and oasis eco-systems is good in principle, but to overcome the complexities, perhaps just one area could be selected initially, then the others brought in at a later stage, once the methodology has evolved.

16. GEF financed activities (paragraph 25) should include monitoring the local renewable energy sources (solar radiation, mean annual wind speeds, hydro potential). This is a gap (as noted in point 3 above).

STAP advisory response	*Brief explanation of advisory response and action proposed*
1. Consent	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. 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.
2. Minor revision required.	STAP has identified specific scientific or technical challenges, omissions or opportunities that should be addressed by the project proponents during project development. Follow up: One or more options are open to STAP and the GEF Agency:

	(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	STAP has identified significant scientific or technical challenges or omissions in the PIF and recommends significant improvements to project design. Follow-up: (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.