

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: January 30, 2012

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Consultant(s):

I. PIF Information *(Copied from the PIF)*

FULL SIZE PROJECT **GEF TRUST FUND**

GEF PROJECT ID: 4612

PROJECT DURATION : 5

COUNTRIES : India

PROJECT TITLE: Development and Promotion of Non-POPs alternatives to DDT

GEF AGENCIES: UNIDO and UNEP

OTHER EXECUTING PARTNERS: MoEF, MHF&W, MoCF, WHO and other relevant national partners

GEF FOCAL AREA: POPs

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): **Major revision required**

III. Further guidance from STAP

The project clearly lays out the challenges of malaria prevention in India. India is the last producer of DDT globally, and according to the PIF is facing countrywide mosquito resistance to DDT, and pyrethroid alternatives. Baseline anti-malarial activity in India is based on indoor residual spraying (IRS) with DDT, malathion or synthetic pyrethroids, and using long lasting insecticidal nets (LLIN). The project seeks to offer some (interim) relief to areas with endemic malaria, given the fact that no other alternatives are anticipated in the next 5-6 years, whilst phasing out DDT production and use. Phase out also halts illegal use of DDT for agriculture, and reduces the pesticide residues in produce for domestic use and export. There is intent to scale up production of alternatives, namely through neem-based pesticides, using cultivars with shorter maturity time, higher yield (taking into account agro-climactic zones in India) and higher lemonoid concentrations, as well as *Bacillus sphaericus* and *thuringiensis* based pesticides/larvacides. Demonstration of new industrial technologies and introduction of environmentally sound, zero waste practices are envisioned, with uPOP avoidance. It should also be noted that since 2006, India has been exporting DDT to Mozambique, Eritrea, Botswana and Gambia. The project will be drawing upon the results of the successfully completed projects executed by the Regional Network on Pesticides for Asia and the Pacific (RENAP)/UNIDO "Technical Support for Development and Production of Neem Products as Environment Friendly Pesticides", and its Phase-II "Production and Promotion of Neem based pesticides as Environment Friendly Biodegradable Alternatives to Chemical Pesticides"

One of the socioeconomic benefits highlighted in the document is that:

"..Rearing and nurturing of neem plantations, collection, procurement and processing of neem kernels and associated activities could boost rural employment and livelihood opportunities – especially for the women and unemployed youth. Utilizing locally sourced and often produced on farm, neem products would reduce cultivation costs appreciably; besides bringing the positive impacts of sustainable farming – currently stressed as it is – due to high intensive agriculture practices. Promoting neem will have a host of environmental dividends in expanding green covers, integrating traditional knowledge systems and encouraging community to adopt sustainable options as an overall culture of development. Due to its socio-economic and political sensitivity the phasing out of DDT in India should be approached in a very cautious and considerate manner."

STAP's comments relate primarily to the risks of neem cultivation and application as an alternative to DDT:

(i) There is an underlying and erroneous presumption throughout the proposal that neem has few or no toxicological effects. While there is limited literature on the side effects of neem in humans, there are published concerns in the scientific literature that suggest that the precautionary principle should be adopted (see Boeke S.J. et al. 2004. Safety evaluation of neem (*Azadirachta indica*) derived pesticides. *Journal of Ethnopharmacology*. Volume 94, Issue 1, Pages 25–41). . What does seem most often indicated is that neem has contraceptive effects (affecting both males and females), that it can cause large impacts in children causing effects similar to aspirin-induced Reye's syndrome, and that care should be taken to minimise ingestion of concentrated oils. Therefore, given the fact that:

- a) the cultivars proposed carry higher lemonoid concentrations;
- b) children often accompany their mothers as they engage in economic activity;
- c) children sometimes assist their parents in such activity.

One might expect that this should be mentioned in the risk section (B.4), that there be some directed research to support the project on both toxicological effects and ways of minimising the risks, along with a clear plan to address appropriate training of workers in handling the neem kernels to prevent inadvertent poisoning, as well as other secondary problems that might arise from more potent neem cultivars. Exposure of children should especially be noted.

(ii) In much the same way one might consider competing land use possibilities for biofuels, the project should have a clear methodology for addressing the acknowledged sensitivities that will undoubtedly be associated with intensive cultivation of neem, and displacement of other uses and forms of agriculture. The project design requires systematic monitoring of the impact on the small-farm productive sector, especially in terms of dryland crops displaced, and the effects on human nutrition and social relationships. Gender issues will need to be examined thoroughly. Displacement creates ecological, economic and social risks, and the risk and stakeholder profiles should be adjusted to suit.

(iii) The project appears to build on past work, that proves the worth of neem as a pesticide. However, this research and development work is not referenced, nor is it referred to especially in establishing risks. STAP will need to see a full evaluation based on preferably peer-reviewed studies that the approach to be used in this project is scientifically-valid and that the resistance potential to neem has been assessed. The project promotes a paradigm shift in anti-malarial practice from DDT to an alternative. Verification and considered scientific proof is needed that neem will indeed perform as expected? It would be good if this could be opened for review and discussion.

In terms of Global Environment Benefits (GEB), STAP questions the claim that neem cultivation will bring positive benefits, especially as related to enhanced carbon sequestration. There is no consideration in the proposal of land degradation or sustainable land management issues. Replacing ground cover by trees without attention to conservation techniques such as interplanting has been shown in places to accelerate erosion, loss of carbon and nutrients and increase flood risks. Intensive monocultures of trees, or any crop, generates environmental impacts that need to be assessed carefully and systematically. At the very least, an impact audit of environmental effects needs to be instituted, but this should preferably be supported by research into the land use options that could incorporate neem as part of a whole-landscape approach – see the GEF5 LD Strategy.

(iv) Other GEB aspects need to be assessed and fully incorporated into the proposal, including climate change impacts such as a climate resilience needs analysis, as does the impact on biodiversity of neem cultivation and application. Changes in cultivation practices and malaria occurrence/vector distribution should also be addressed.

(v) Further, STAP is concerned about the impacts on the countries to whom India currently acts as sole provider of DDT. In negotiating the DDT exemption under the Stockholm Convention, producers and consumers will have collaborated closely. So if India is the sole producer of DDT, what is to be done for all the other countries that depend on DDT for their own malaria control programmes? This potentially could be a threat to the GEBs generated by these other countries, and could therefore either exacerbate or transfer problems from India to elsewhere.

STAP welcomes any opportunity to phase out toxic substances, and there is merit in trying to do so. It is also the right of a country to determine the economic activity in which it wishes to be engaged. But in this instance STAP wishes to emphasize that there needs to be clearer indication (inter alia) that alternatives have been proven to be efficacious, will not result in a host of secondary problems, that there is indeed a community-based strategy to get buy-in to change land use patterns to accommodate intensive neem cultivation, thus better showing readiness for large scale production. More worrying, this project has implications for the Malaria Control Programmes of other countries, and could result in calls for more follow-on GEF and other investment in impacted countries; and so it should not be determined in isolation. However, this project does have a lot of potential as a targeted research project to track the efficacy of complementary and assorted non-DDT alternatives in a large country; and perhaps this might be explored with the country, GEF Sec, STAP et. al.

A further point, outside the major points above, concerns the Project Framework. STAP notes that the Expected Outcomes as worded in the proposal are little more than generalized statements of the Expected Outputs. To be valid and to help track a truly beneficial outcome, the Expected Outcomes must highlight the major change to which the Outputs will contribute. So, for example, the Output for Component 3 is the promotion of IPM and new cultivars of neem. The Expected Outcome should address what this promotion will achieve – possibly, a major change in farm practice and uptake of new cultivars – rather than a tame re-statement of IPM promotion.

Related to the above point, the proposal is also lacking in indicators of GEBs, and the methodologies and techniques for their measurement. This is now a necessary requirement for all projects funded by the GEF, that tracking of the environmental benefits be fully internalized in the project. The indicators should preferably be drawn from the GEF focal area strategies.

<i>STAP advisory response</i>	<i>Brief explanation of advisory response and action proposed</i>
1. Consent	STAP acknowledges that on scientific/technical grounds the concept has merit. However, STAP may state its views on the concept emphasising any issues that could be improved and the proponent is invited to approach STAP for advice at any time during the development of the project brief prior to submission for CEO endorsement.
2. Minor revision required.	STAP has identified specific scientific/technical suggestions or opportunities that should be discussed with the proponent as early as possible during development of the project brief. One or more options that remain open to STAP include: <ul style="list-style-type: none"> (i) Opening a dialogue between STAP and the proponent to clarify issues (ii) Setting a review point during early stage project development and agreeing terms of reference for an independent expert to be appointed to conduct this review The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.
3. Major revision required	STAP proposes significant improvements or has concerns on the grounds of specified major scientific/technical omissions in the concept. If STAP provides this advisory response, a full explanation would also be provided. Normally, a STAP approved review will be mandatory prior to submission of the project brief for CEO endorsement. The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.