

## CEPF Final Project Completion Report

*Instructions to grantees: please complete all fields, and respond to all questions, below.*

<b>Organization Legal Name</b>	Keystone Foundation
<b>Project Title</b>	Sowing seeds for a green economy: Exploring payment for ecosystem services in Nilgiri Biosphere Reserve
<b>CEPF GEM No.</b>	62927
<b>Date of Report</b>	31.01.2016
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### **CEPF Region:**

**Western Ghats**

### **Strategic Direction:**

Strategic Direction 1. Enable action by diverse communities and partnerships to ensure conservation of key biodiversity areas and enhance connectivity in the corridors

Investment Priority 1.1 Test pilot models of community and private reserves to achieve conservation outcomes at priority sites and critical links in unprotected areas in the priority corridors

**Grant Amount: \$ 185525.86**

**Project Dates:** 01-06-2013-30.12.2015

### **1. Implementation Partners for this Project (*list each partner and explain how they were involved in the project*)**

The following partners were involved in the implementation of the project:

- i. Aadhimalai Pazhangudiyanar Producers' Company Limited (APPCL) – value chain and value addition of NTFPs with community based ecological monitoring as embedded practice; trading with large volume NTFP
- ii. Last Forest Enterprises (LFE) Private Limited – marketing of NTFP, consumers' consciousness, ecological certification of NTFPs, Participatory Guarantee systems.
- iii. Dr. K. Jagdish, ATREE – Honorary Advisor – Water Component, training & capacity building. Jagdish's current project on Carbon & Hydrology assessment and monitoring will complement the water resources and PES project. We have had a presentation by his team on his project at Keystone, Kotagiri in March 2013. Jagdish Krishnaswamy is a member of the Regional Implementation Team and did not receive any funding from the CEPF grant.

iv. ACWADAM – Consultant for hydrological assessments and spring-shed related work. They will bring in rich experience on PES at Palampur – Himachal Pradesh and their spring / stream related work in Sikkim – another biodiversity hot spot in the Eastern Himalayas. They would be involved in building capacity of Keystone staff and community members in hydrological monitoring and assessments.

v. Nilgiri Natural History Society (NNHS) – outreach and communications; coordinating and engaging. With civil society and other stakeholders through public consultations and meetings.

vi. Nilgiris Field Learning Centre (NFLC) – Keystone Foundation – Cornell University partnership <http://blogs.cornell.edu/nflc/>; specifically for this project Assistant Prof. Steven Wolf – Ecosystem Services.

### **Conservation Impacts**

#### **2. Describe how your project has contributed to the implementation of the CEPF ecosystem profile**

The project was successful in addressing three important ecosystem services aspects such as water, non-timber forest produce (NTFP) and pollination in the Nilgiri Biosphere Reserve (NBR). It was a first step towards quantifying these services. The socio-ecological system (SES) derived for the regions under the purview of this project have helped ascertain associated social actors and institutions to the bio-geo-physical unit, the NBR. The project opened up avenues to explore further with the case of implementing a payment for ecosystem services framework in the region as a means to address the conservation issues in the region and can be extended to the larger expanse of the Western Ghats.

#### **3. Summarize the overall results/impact of your project**

##### **Planned Long-term Impacts - 3+ years (as stated in the approved proposal)**

*List each long-term impact from Grant Writer proposal*

- i. Improved water resource management in the Coonoor River Basin by all stakeholders concerned
- ii. Improved returns to communities who collect NTFP with better valuation of forest produce and improved terms of trade
- iii. Strengthen protection of stretches of forest that is a habitat for a diversity of pollinators' forests within estates, village boundaries etc. that are important to crops. The area that will be addressed is approximately 2000ha.

#### **4. Actual progress toward long-term impacts at completion**

1. **Water:** The groundwork in terms of generating a knowledge base on the upstream downstream interdependence between the Coonoor town and the villages in the catchment areas has been accomplished. There is still periodic data collection on spring

discharges, stream flows, water quality etc. that is being collected. Over the next few years this would provide further evidence of the state of water resources in the region and the impact of conservation measures undertaken, if any.

2. **NTFPs:** By gathering data on valuation, value chains and building concepts of sustainability, NTFPs seem to be part of a larger system of biodiversity. Whereas experiments on willingness to pay and certification can be done for products in the market, evolving a PES for NTFPs is possible, only by recognizing the area (forest) as a whole and including a cumulative value to the services provided by a biodiversity rich area. In the future, models will be worked out by policy and governance interventions that promote sustainable use and conservation.
3. **Pollination:** Through dialogues with the State Forest Department and private plantation estates, the findings concerning as crucial for pollinator health: forest availability and pesticide free farming.

#### **Planned Short-term Impacts - 1 to 3 years (as stated in the approved proposal)**

*List each short-term impact from Grant Writer proposal*

1. The effectiveness of a socio-ecological systems (SES) framework as a tool for promotion of payment for ecosystem services (PES) demonstrated in the Nilgiris Biosphere Reserve, as evidenced by a commitment by the relevant authorities in Erode and Nilgiris districts to pilot a PES mechanism for at least one of the services (water, pollination, NTFP provisioning) targeted by the project.
2. Metrics for PES mechanisms developed, as evidenced by reports of economic valuation of water, pollination and NTFP provisioning services in selected pilot sites.
3. Strengthened capacity for action-oriented research by Keystone Foundation and other civil society groups in the field of PES, as evidenced by number and quality of research reports and peer-reviewed papers.
4. Mechanisms to strengthen sustainable management of forests and other natural ecosystems outside formal protected areas through direct or indirect incentives to local stakeholders developed, as evidenced by at least three proposals for PES mechanisms submitted to the relevant authorities.

#### **5. Actual progress toward short-term impacts at completion**

**Water:** Upon closer examination of the situation in the Coonoor region, more than an economic analysis, a geohydrological analysis as in the case of Palampur in Himachal Pradesh, seemed more appropriate. Such an approach has highlighted the upstream downstream connect; paving the way for a targeted exploration of PES based mechanisms to conserve water resources.

**NTFPs:** The research in Sathyamangalam area on NTFPs shows that the undervaluation of NTFPs leads to low returns to harvesters and low conservation status. The model which is local, managed and run by local communities balances sustainable harvesting and better

returns to gatherers. It also helps provide employment in rural areas with value addition. The trials of certification and willingness to pay were done with good results from the market. It is possible in the short loop to try this model in local marketing scenario such as those with AAPCL, Last Forest.

**Pollination:** The research on pollinators that founded some of the study's main conservation goals has been completed and has given a clear sense of the where pollinator habitats are and what kind of foraging resources are required for bees to thrive well. PES models were explored with three different kinds of stakeholders, each with varying degree of success in negotiations.

## **6. Describe the success or challenges of the project toward achieving its short-term and long-term impact objectives**

**Water:** The complexity of the hydrogeology of the Nilgiris meant that quantification of water flows was not feasible. This is because spring systems and wetlands on which the town depends for its base flows are difficult to quantify and there are multiple points of extraction by various actors before the source of water supply to the Municipality is reached. Given the sensitive social context, where old Badaga habitations see newer settlements of Sri Lankan repatriates as competitors for water resources such as springs, measurement of flows is also politically loaded. Since most of these villages are new to Keystone, it has taken time to develop trust with the communities, through other interventions such as a spring conservation project supported by Arghyam, Bangalore. We now have the consent of the communities dependent on springs in the Ambikapuram valley to measure spring discharges.

**NTFPs:** The NTFP component had the advantage of having institutions within the Keystone umbrella, which could take part in this data collection and trial. The success was that actual trials could be conducted to see the impact of concepts like willing to pay. The success was also in determining value chains for different NTFPs and in understanding the impact of harvest on their sustainability. The overall scenario can be shared with community groups and build a system of monitoring through barefoot ecologists. The challenges in the PES for NTFPs was in determining the actual value of any NTFPs including subsistence, cultural and ecological values. It was difficult to also build a model based on each NTFP, which meant that larger areas of habitat had to be taken. These will have to be advocated for protection and sustainable use.

**Pollination:** Under the pollination component, the PES project involvement with the private tea estate in Coonoor helped achieve a tangible impact on 'converting land under plantation to native vegetation'.

Its conservation agenda was to convert some of the tea plantation to natural vegetation of Shola forests and montane grasslands, to support biodiversity (such as bees, birds and mammals) and ecosystem services (pollination, seed dispersal, water retention and wetland recharge) in the area. Twenty% of the area under tea was proposed to be converted to natural vegetation cover.

Produce from the rest of the tea can be sold at a niche market that recognises the value of organic tea. If neighbouring tea farmers can be convinced to convert their tea to organic and convert some land under tea to natural forest or grassland cover, then a secure market for their produce can be offered as an incentive to enhance biodiversity of the area.

The PES intervention was to provide advice and draw a work plan for the tea estate. In the upper elevations, grassland species be left to establish. Species such as *Centella* and *Cymbopogon* can be planted since they are seen in the adjacent strip of land. In the lower slopes, Shola saplings could be planted during the monsoon. Density of tea bushes will considerably decline even on land under tea cover, leaving space for native grasses and trees to regenerate.

#### **7. Were there any unexpected impacts (positive or negative)?**

None for the project.

#### **Project Components and Products/Deliverables**

##### **Component 1 (as stated in the approved proposal)**

*List each component and product/deliverable from Grant Writer*

**Component 1:** Development of a framework for PES mechanisms for water services in the Nilgiri Biosphere Reserve (Coonoor)

- Report on the demand -supply situation through quantification of water flows within the study sites including assessment of the inflows and outflows, maps, user profile and the seasonal monitoring protocol for water quality within the study sites.
- Report on the assessment of existing economic transactions with regard to water in the study sites
- Proposal on establishing a pilot on PES in water resources in the study sites.
- [www.nilgiriswaterportal.in](http://www.nilgiriswaterportal.in) website updated with all project data and findings.

#### **8. Describe the results from Component 1 and each product/deliverable**

We had made a calculation of the demand supply situation of water in the scenario building work as part of the earlier CEPF Grant for the project 'Mainstreaming Conservation Action in District Public Policy'. We had planned to refine this with more detailed data collection in certain study sites. However when reviewing other PES projects, we realised that it is impractical to quantify the flows of water before and after a PES intervention to provide a basis for payment. Instead, as illustrated in the Palampur case study, establishing a clear linkage between the

recharge areas in the upstream and the discharge areas in the downstream can be a basis on which PES arrangements could be developed.

Therefore the brief of the study by ACWADAM was modified to be a hydrogeological study identifying key areas in the catchment that determine water flows into the town's water sources. This report is more pertinent in our opinion. Thus accordingly the deliverable has been modified towards the end of the project.

As a corollary, our earlier assumption that the individual consumers of water may be buyers, since they already spend significant sums out of their pockets to access adequate water, has been modified to the Municipality being the single buyer. This is because, world over most operational PES mechanisms involve the government being the buyer. In Tamil Nadu, this would be in line with the successive governments' populist policies. Therefore rather than examine the economics of water related transactions in details, we focused on collaboration with Cornell University to examine the various successful models of PES in water and to recommend appropriate alternatives that the stakeholders in Coonoor could choose from. This is the second deliverable.

The Municipality has been looking at traditional solutions for solving the water crisis. These include desilting of the Ralliah dam, increasing the distribution capacity, digging new open wells to add to the list of existing water sources and linking the outflows from upper area reservoirs to the Ralliah dam. Therefore while we have put together a note on possibilities for a pilot intervention around PES for water in Coonoor, it has not been tried out with the stakeholders as yet.

#### **Component 2 (as stated in the approved proposal)**

*List each component and product/deliverable from Grant Writer*

- Report on the valuation of NTFPs using ecological and other holistic factors
- Report on the value chain analysis of select NTFPs
- Report on the mechanism of Eco-certification developed
- Proposal to implement models of green economy associated with PES

#### **9. Describe the results from Component 2 and each product/deliverable**

The NTFP component has analysed valuation and value chain aspects; It has also developed a eco certification format based on the principles of participatory guarantee systems and done a trial for willingness to pay. The model of green economy and 'protected area' concepts are discussed towards the concept of PES. All the aspects are incorporated as chapters in a single report.

#### **Component 3 (as stated in the approved proposal)**

*List each component and product/deliverable from Grant Writer*

- Popular article on pollination services offered by forest landscapes to agriculture and food security.
- Peer reviewed article on the pollination ecology of crops in relation to the bee reserves in the forest patch in question
- Report on the economics of pollination which would involve the estimation of market value and annual productive use value
- Develop a model that can predict the impact of loss of one or many pollinator nesting sites on crop productivity

#### **10. Describe the results from Component 3 and each product/deliverable**

A popular article on pollinator management was published in the newsletter of the Nilgiri Natural History Society.

A model was developed based on a survey of ten vegetable farms at a distance gradient from adjoining forest, the hypothesis being – farms closer to forests benefit more from bee activity than farms at a distance from the forest edge.

The evaluation of pollination services in crops was not worked out. Instead, the time was invested in using the research findings to support negotiations with stakeholders.

Based on findings from the coffee and vegetable farms where data were gathered, a manuscript is being drafted for submission to a peer reviewed journal.

#### **Component 4 (as stated in the approved proposal)**

*List each component and product/deliverable from Grant Writer*

- Report on the profile developed for the selected four study sites.

#### **11. Describe the results from Component 4 and each product/deliverable**

The results of the SES profile are described in detail in the report.

#### **12. If you did not complete any component or deliverable, how did this affect the overall impact of the project?**

**Water:** As stated under the component 1, the planned *assessment of existing economic transactions with regard to water* was dropped in favour of a hydrogeological approach. This has enhanced the impact of the project as it has created an accessible knowledge base on a subject that is not well understood locally by various stakeholders and the available knowledge was in the hands of a few experts only. Unlike economic transactions which may change from time to time depending on market conditions, government policies etc. the hydrogeological study has focused on deeper relationships between stakeholders and parts of the landscape that are not

easily changed. This is thus a more solid ground for bringing stakeholders together and reiterating their interdependence.

We invested in a flume to measure the base flows in the Ralliah dam. With the help of ATREE, we identified a site that was on Municipal land for installing the flume in summer. Unfortunately, delays in importing the flume and getting the permission from the Municipality meant that we lost the summer of 2014 and the heavy rains towards the end of that year meant that the site chosen was inundated until March 2015. The rest of the year saw good rains almost from April to December, which meant that the flume could not be deployed. An alternate site was not feasible, as further upstream the land was under forest department and getting permissions to set up the flume would not have been feasible given the project time frame. The change in approach to a hydrogeological one has also changed the data needs, so the project did not suffer due to the lack of the flume data.

**NTFPs:**

**NA**

**Pollination:** Negotiations with the State Horticultural Dept. on facilitating a procurement mechanism for pesticide free vegetable produce from the study site did not reach a decision. Certification as a compensatory tool for supporting/ encouraging organic farmers was being explored as one of the PES models. Although theoretically it is clear, the stakeholder discussions need a follow up, to make this particular model successful.

**13. Please describe and submit any tools, products, or methodologies that resulted from this project or contributed to the results**

NA

**CEPF Global Monitoring Data**

Respond to the questions and complete the tables below. If a question is not relevant to your project, please make an entry of 0 (zero) or n/a (not applicable).

NA

**14. List any vulnerable, endangered, or critically endangered species conserved due to your project**

NA

**Hectares Under Improved Management**

Project Results	Hectares*	Comments
<b>15. Did your project strengthen the management of an existing protected area?</b>		<i>List the name of each protected area</i>
<b>16. Did your project create a new protected area or expand an existing protected area?</b>		<i>List the name of each protected area, the date of proclamation, and the type of proclamation (e.g., legal declaration, community agreement, stewardship agreement)</i>
<b>17. Did your project strengthen the management of a key biodiversity area named in the CEPF Ecosystem Profile (hectares may be the same as questions above)</b>	~200	Yes, Solitary bee nesting sites were erected in farms near Sathyamangalam Tiger Reserve, and two coffee estates near Coonoor, as a pollinator management tool.
<b>18. Did your project improve the management of a production landscape for biodiversity conservation</b>	~150	The agricultural farms near Sathyamangalam Tiger Reserve. A private tea estate near Coonoor town, Nilgiri Biosphere Reserve.

*\* Include total hectares from project inception to completion*

**19. In relation to the two questions above on protected areas, did your project complete a Management Effectiveness Tracking Tool (METT), or facilitate the completion of a METT by protected area authorities? If so, complete the table below. (Note that there will often be more than one METT for an individual protected area.)**

NA

Protected area	Date of METT	Composite METT Score	Date of METT	Composite METT Score	Date of METT	Composite METT Score

**20. List the name of any corridor (named in the Ecosystem Profile) in which you worked and how you contributed to its improved management, if applicable.**

NA

**Direct Beneficiaries: Training and Education**

<i>Did your project provide training or education for . . .</i>	<b>Male</b>	<b>Female</b>	<b>Total</b>	<b>Brief Description</b>
<b>21. Adults for community leadership or resource management positions</b>				
<b>22. Adults for livelihoods or increased income</b>				
<b>23. School-aged children</b>	100	115	215	Outreach activities on PES done at 5 schools in the Nilgiris through the Nilgiri Natural History Society
<b>24. Other</b>				

**25. List the name and approximate population size of any “community” that benefited from the project.**

*Community name, surrounding district, surrounding province, country*      *Population size*

NA



## Lessons Learned

**27. Describe any lessons learned during the design and implementation of the project, as well as any related to organizational development and capacity building. Consider lessons that would inform projects designed or implemented by your organization or others, as well as lessons that might be considered by the global conservation community**

**Water:** In the Indian context, with respect to water, it would do well to remember that the state is responsible for providing this resource in most places. This could be through line departments, Municipalities, Panchayats etc. The state is also the agency that proactively spends on conservation through forest conservation, watershed development etc. Thus, a clear cut case of different sets of buyers and sellers seems less likely in the case of water. Although communities in the upstream and downstream may be different, the economic argument would have to be couched in a larger understanding of the social – ecological context. For instance, a municipality entering into an agreement with a Panchayat recognizing the latter’s role in water provision through land management, may be more significant than the actual amount paid.

**NTFPs:** The research on NTFP involved dealing with markets, traders and several roleplayers along the value chain. In this context, it was difficult to discuss aspects of sustainability. The informal market players were hesitant to reveal many details. The main lesson that is learnt is the community led small scale micro enterprises based on NTFP can bridge the aspects of sustainability and economic gain. They have the potential to develop across the country and become the vehicle for sustainable harvesting in NTFPs. Larger scale PES models will have to be worked out keeping the larger biodiversity in mind.

**Pollination:** Under the pollination component, several private estates that were approached to implement a ‘rent out/ buy back’ PES model were hesitant to take the risk of converting even a small percentage of their plantation to “pesticide-free”. Although the research part of the project went smooth and methodical, political negotiations were time-consuming and often slow on delivering results.

**28. Project Design Process (*aspects of the project design that contributed to its success/shortcomings*)**

For the pollination component: Using multiple sites and varied interactions between stakeholders proved to be a strategic design, since PES by nature responds to specific situations.

The conservation goals around protecting pollinator habitats and foraging grounds helped build a study design with a strong hypothesis that was possible to test scientifically. The research findings became evidence while carrying out negotiations with the stakeholders.

**29. Project Implementation (*aspects of the project execution that contributed to its success/shortcomings*)**

For the pollination component, although the project design was in place early on during the project, it was open to change and evolution. This is why it was possible to adapt, and use the private tea estate in Coonoor as a functioning PES model with biodiversity conservation as a larger goal, considering that pollinators (or bees) are a part of biodiversity. Dialogues with State Horticultural Department required a follow up from us at a higher level, but other stakeholder meetings and modeling did not allow it to happen.

**30. Describe any other lessons learned relevant to the conservation community**

Ecosystem services and benefits that are intangible such as bees and pollination are challenging for conservation and management. Pollinator habitat management is a recent subject and requires a thorough understanding of the study system in question and the many potential factors that affect bee populations – presence of native forests with bee nesting sites, farming practices (hedge diversity, pesticide use, etc.) in agricultural farms, water availability and so on.

While working towards the conservation of water, it is crucial to map and understand the hydrogeology and the aquifer systems. Especially in areas where springs abound, going by the surface topography as in a watershed approach is insufficient.

**Sustainability / Replication**

**31. Summarize the success or challenges in ensuring the project will be sustained or replicated**

Keystone has built on the work of the successive CEPF grants for the work on water resources in the Coonoor region and attracted Arghyam to fund a spring conservation initiative. This takes forward to conservation of the spring sheds which are crucial to the water supply of the town. The outputs of this grant would be used to take forward this work in the coming years and to rope in the Municipality as a stakeholder in spring conservation.

Access to knowledge is often a barrier to replication. Thus posting of all the project outputs online at the <http://nilgiriswaterportal.in> website under a CC-BY (Creative Commons Attribution) license would reduce this barrier to a great extent.

**32. Summarize any unplanned activities that are likely to result in increased sustainability or replicability**

The PES (Pollination) models explored with the Horticultural Department and private coffee estates hold high replication potential. Private estates are less challenging to negotiate with, but with the

Government stakeholders, it is possible to work around existing schemes and create incentives for bee conservation.

### **Safeguards**

**33. If not listed as a separate Project Component and described above, summarize the implementation of any required action related to social, environmental, or pest management safeguards**

The Compliance with CEPF Social Safeguard Policies monitored and reported to CEPF was followed throughout the course of the project and reports have been submitted.

### **Additional Comments/Recommendations**

**34. Use this space to provide any further comments or recommendations in relation to your project or CEPF**

## Additional Funding

**35. Provide details of any additional funding that supported this project and any funding secured for the project, organization, or the region, as a result of CEPF investment**

<b>Donor</b>	<b>Type of Funding*</b>	<b>Amount</b>	<b>Notes</b>
Swallows in Sweden	A - Project Co-financing	100,000	Salaries and administration expenses
Nilgiri Field Learning Centre	A - Project Co-financing	97,040	Travel and other related expenses for students from Cornell University to work on the Water component of the PES project
Ecosystem Alliance	A - Project Co-financing	125,000	Salaries and administration expenses

*\* Categorize the type of funding as:*

- A Project Co-Financing (other donors or your organization contribute to the direct costs of this project)*
- B Grantee and Partner Leveraging (other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF funded project)*
- C Regional/Portfolio Leveraging (other donors make large investments in a region because of CEPF investment or successes related to this project)*

## Information Sharing and CEPF Policy

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned, and results. Final project completion reports are made available on our Web site, [www.cepf.net](http://www.cepf.net), and publicized in our newsletter and other communications.

Please include your full contact details below:

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