The Rufford Small Grants Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Vandana Krishnamurthy
Project title	Ethnobotany, Trade, Life History, and Population Dynamics of Endemic *Cycas* Species in the Western Ghats of Southern India
RSG reference	39.01.10
Reporting period	July 2010 – July 2011
Amount of grant	£5,913
Your email address	vandana@hawaii.edu
Date of this report	09/02/2012

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Identifying markets that sell *C. circinalis* and *C. indica* plant parts			√	The initial few months were spent on extensive market surveys to identify markets which were involved in the sale of *Cycas* spp.
Identifying economics of the trade and other trade dynamics		√		Regular bi-monthly surveys are ongoing and will be completed in December 2012.
Gathering and compiling ethnobotanical information			√	Completed between July to September 2010.
Measuring the ecological impacts of leaf, pith and seed harvest		√		Bi-yearly surveys in progress.
Measuring phenology in different harvest types		√		Monthly data collection in progress.
Conducting germination trials of seeds from different harvest types	√			Seeding season hasn't been good enough to collect seeds.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

Permits for the pith harvest site have not been acquired as yet in the state of Tamil Nadu. This state has a rule that if the research is conducted in a foreign university, the permit should be routed through the National Biodiversity Authority of India. This process had taken more than a year and I am still awaiting permits.

Another challenging aspect of this study is the enigmatic markets for the sale of pith in southern India. Although there is a lot of hearsay about the use of the pith, there is no apparent trend in the sale which defines the specific use. We are very hopeful that the longer term data that is being collected will help prove the specific use of the pith and its particulars. Additionally the seeding season has not been adequate to initiate the germination trials.

3. Briefly describe the three most important outcomes of your project.

During the reward period I have been able to gather much data on each of the three components of my study.

1. Ethnobotany:
   Seven villages were chosen for this study. Semi-structured interviews were conducted in these sites to gather information about use, harvest, seasonality, etc. Each of these respondents was indigenous harvesters, not involved in the commercial harvest of the plant produce. In general, respondent identified the leaves and seeds to be an important produce

for harvest in these forest communities. In the two states identified for this study, respondents in Tamil Nadu used the seeds less however the respondents in Kerala had a higher and larger scale use of the seeds as food. Additionally, there is a decreased trend in harvest in Tamil Nadu by local communities; on the other hand Kerala has a regular harvest in the fruiting season. Apart from these differences, the uses in both these states are specific as well. In Tamil Nadu, they use leaves, seed, and bark for consumption and medicinal value while in Kerala mostly seeds is uses and rarely some leaf harvest for consumption.

2. Market studies:
    a. Leaf harvest: Bi-monthly surveys are being conducted in markets for leaf harvest since January 2011. Five different vendors are being interviewed for patterns in supply and demand, prices, uses etc. Trends in data between January and December 2011 show that supply follows a close relationship with the cultural calendar. However, there was no clear association between the quantity and the price of the leaves. Supply could be as low as 100 bundles with a high price of 20 rupees/bundle as well as 500 100 bundles with a low price of 12 rupees/bundle. Highest supply of leaves was 500 bundles. Each bundle has 15 leaves.
    b. Pith harvest: Two medicinal markets have been identified for the sale of pith. One central market in Chennai and the other smaller market in Madurai, both in the state of Tamil Nadu. Given that the pith trade is so secretive and unclear, we are not sure of the uses. Traders say that they are being purchased by the Siddha doctors of southern India to cure stomach related disorders, while some others say that it is an adulterant for *Pueraria tuberosa* , a tuber from the family Fabaceae. Longer term studies that are being carried out currently, will help clarify the specific uses.

3. Ecological sampling
   Nine long term monitoring plots have been set up to measure demography parameters in Kerala and Karnataka. Of these sites, six are seed harvested sites and three are leaf harvested sites. The pith harvested sites are still awaiting permits. During the grant period, we set up the plots and started the monitoring. Monitoring has been conducted thrice so far. The last dataset will be collected on April 2013.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

This work is being carried out alongside local communities and the Forest Department. Results from this project will be shared with local communities to engage them in a community conservation initiative to protect these cycad species in addition to maintaining their traditional practices of using these plants as food, medicine and cultural value. This will allow community members to legally harvest cycad species to generate livelihoods. The findings will be used to provide recommendations for management strategies that combine ecological knowledge and traditional knowledge in order to develop sustainable harvest limits along with *in situ* and *ex situ* conservation activities, such as seed and vegetative propagation programmes.

5. Are there any plans to continue this work?

The project is presently progressing to include data from the re-monitoring of permanent sites set up in the cycad habits. This will continue every 6 months for 2 more years. This data will be analysed

and a series of recommendations will be generated not just for local communities, but commercial harvesters as well. We have been collecting data from the markets which we will evaluate to identify the trend in the market dynamics. The results will be shared with commercial floriculturists and vendors in the medicinal markets as well to alert them to the impacts of large-scale harvesting.

6. How do you plan to share the results of your work with others?

In the last year I have been able to publish popular articles in local newspapers on the intensive use and conservation of these species. Some preliminary work from this research has been submitted to the journal *Tropical Ecology* from which we are awaiting news. Apart from this, the results will be published in peer-review journal adding to the literature on cycads, impacts of harvest of non-timber forest products, plant ecology, and conservation. Results will also be shared with the local forest departments, local communities, and non-governmental organisations with an opportunity to be part of an awareness campaign and education programme on the conservation of these ancient relics and their ecological and traditional importance.

7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

The grant was used from June 2010 to July 2012. Since this fund was originally used to purchase equipments, nursery equipments, pay salaries and set up plots, it has been used as per the anticipated period.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Equipment	493	520	27	Apart from the equipment that was purchased, a vernier calliper was purchased to measure seed dimensions
Expendable supplies	453	380	70	The dendrometer bands were not set up as it was not a practical option
Local travel	3851	4167	316	Since the sites are far apart and needed to be re-visited several times, the cost of transport was higher than anticipated.
Extra Manpower	1116	1156	40	Salaries had to be increased
Total	**5913**	**6223**	**453**	The additional funds were acquired from another grant from Botany-in-action grant, Phiips Conservatory

9. Looking ahead, what do you feel are the important next steps?

The re-monitoring at cycad habitats and market surveys will proceed for the next 2 years or less. Apart from the data collected and analysis completed one of the most important steps is to get the local communities involved in the education and awareness of the effects of harvest. Keystone Foundation has already set up Cycad conservation centres in some villages. We will take this on in a

larger scale to inform local communities in all cycad habitats along with other organisations such as Mysore Amateur Naturalists who have also shown keen interest in cycad conservation. Apart from education, results from the germination experiments, can be used to set up sustainable plantation sites as extractive reserves to address the commercial markets for floriculture and medicinal value. Until this is established, commercial harvest in cycad habitats will have to be drastically reduced and vendors in the markets can explore substitutes as options for sale.

10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

The RSF logo was used in presentations in Pittsburgh and China as part of advancing this research.