

## 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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

Grant Recipient Details	
<b>Your name</b>	Prerna Agarwal
<b>Project title</b>	Assessing the ecological impact of tourism and developing ecotourism through stakeholder participation for conservation of Kas plateau, Maharashtra, India.
<b>RSG reference</b>	12117-1
<b>Reporting period</b>	September 2012- January 2014
<b>Amount of grant</b>	£5985
<b>Your email address</b>	<a href="mailto:prernaagarwal17@gmail.com">prernaagarwal17@gmail.com</a>
<b>Date of this report</b>	22nd February 2014

**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
Vegetation sampling: To monitor the impact of trampling of tourists on herbaceous plant assemblages across a disturbance gradient		✓		We have completed what we had planned to do for this objective. However, we believe that to fully understand the impact of human trampling on this ecosystem, long term monitoring is required.
Effect on insect pollinators: to assess the impact of tourist movement on flower-visitor abundance by comparing disturbed and undisturbed areas	✓			At the onset of the project, the study site got declared as a UNESCO World natural heritage site, and hence we didn't get collection permits for fauna, which was necessary for identification of pollinators. Considering this, necessary changes were made in the study design and this objective was not included in the final study.
To quantify the waste generated by littering			✓	The waste was quantified during the tourist season of 2013. The members from local communities and Satara Forest Department and citizens were involved in this process
To understand stakeholder perceptions towards conserving the fragile habitat through structured interviews			✓	A representative sample from both tourists and villager groups were interviewed. The analysis showed interesting results regarding perceptions of various stakeholder groups. This also helped shape the awareness and sensitisation plan in my study. Considering this, I plan to conduct another round of interviews in the coming season to assess efficacy of diverse environmental awareness campaigns. It will help to design an effective long-term sensitisation programme.
To identify and train interested local individuals and forest department guards for better protection of this ecosystem			✓	Ten local people from four villages trained intensively as part of my project and are regularly working on the plateau as nature guides. Along with this, I conducted two training sessions at the onset of the flowering season (May-June 2012 and 2013 respectively) for the local villagers, with support from the Forest Department, each with 45 participants. In 2012, there were

				<p>two nature guides on the plateau, and this number increased to 10 after the training sessions.</p> <p>During the village surveys, my team identified many problems of livelihoods, such as urban migration, low level of non-agricultural skills, etc. There is a need to identify and train locals in various skills and diverse livelihood practices, to help them in maximising local benefits from tourism economy and at the same time help in conservation of the habitat. Nature guide training is one of such skills that we have started with.</p>
To initiate responsible tourism by creating awareness among tourists through sensitisation tools such as presentations, personal interactions and media			✓	<p>I achieved this through media- television, radio, internet, newspapers and presentations. Together with the team, we managed to reach out too many groups conducting nature tours on the plateau. Several of them accessed our sensitisation literature, presentations, and personally interacted with our trained guides. Three groups helped in the citizen campaign to remove garbage along with the JFMC. Many have promised full support in next year, and some have started own initiatives to work with local people. I consider this as resounding success for my project.</p> <p>Our next challenge is to work towards sensitisation of unorganised tourism, which forms a large percentage (95%) of the total visitors coming to the plateau on weekends. This requires a different on-field approach, which I am designing with help of forest department and local communities. A strong outreach programme with mass media is being conceived for this.</p>
To provide suggestions for an alternative plan for tourist movement using mapping techniques to minimise impact on sensitive areas of the plateau		✓		<p>I am working on the alternative tourist movement plan with designers and it will be presented to concerned authorities, to discuss on how to implement it beginning with this tourist season.</p>
To provide management suggestions for regulation of tourism and for alternative income generation by local			✓	<p>We have already provided training for tourist guides and have been involved in capacity building sessions for the homestay in a nearby village, both of which are</p>

communities				<p>promising alternative income options. We tried out the proposed alternative plan this season by marking the suggested trails with coloured rocks. We received a positive feedback from the visitors regarding this initiative. We will soon conduct a meeting with the concerned authorities to propose the alternative tourist regulation plan.</p>
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Note: JFMC stands for Joint Forest Management Committee

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

One of the objectives of the project was to assess the impact of tourist trampling on the ephemeral vegetation, for which the tourist movement pattern played an important role to decide control and trampled vegetation plots. The sampling technique was designed based on our previous observations of tourist movement on the plateau. However, just at the beginning of the field season, an artificial factor came into place: the tourist movement was restricted by the Forest Department by constructing barricades along the access routes. We realised that the sampling method had to be altered to suit the new tourist movement. Hence, we observed the tourist movement for one season and data was systematically collected in the following year after getting a considerable knowledge of trampled and untrampled areas. The heavy publicity due to World Natural Heritage Site status (gained in July 2012) attracted extremely diverse groups of tourists in large numbers. Necessary changes had to be made in the earlier outreach plan to reach out to the diverse groups and reorient them towards sensitive tourism. Visitor demands and shortage of field personnel to manage the huge crowds created many problems in on-field tourism management, which resulted in widely fluctuating tourist movement pattern even within a week. This was carefully monitored on a regular basis, to be able to correlate with the trampling effect data. Thus, along with quantitative methods, qualitative data was carefully recorded and is being used in analysis.

We faced another unforeseen difficulty of getting permissions for collecting insects. At the onset of the project, the study site got declared as a UNESCO World natural heritage site, and hence obtaining permissions within the limited project period, to collect insects (even for identification purpose) for one of the objectives 'to assess impact of tourism on insect pollinators' became impossible. We thus decided to remove this objective from the study.

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

**a. Impact of trampling on vegetation:** One of the key objectives of the study was to understand the impact of human trampling on species richness and diversity of the ephemeral vegetation which attracts thousands of visitors every year. The preliminary results suggest that ephemeral flush vegetation type (Figure 1) and *Pleocaulis sessilis* dominated vegetation (Figure 2) are relatively more sensitive to trampling as compared to vegetation dominated by *Impatiens lawii*. It was observed that relative percent cover of bare ground, species richness and diversity reduced considerably with increase in trampling intensity and the data collected is currently being analysed. While this is a long-term study, the data collected so far is invaluable as it will contribute to the sparse information available on this subject. We are positive that this data will help the managers to take informed

decisions to minimise the negative impact of recreational activities on the plateau and similar such areas.

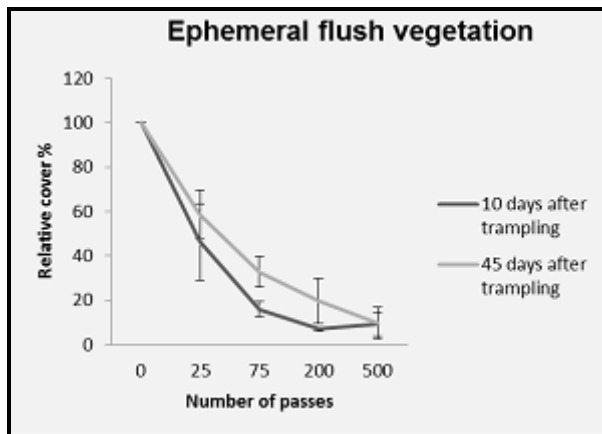


Fig. 1

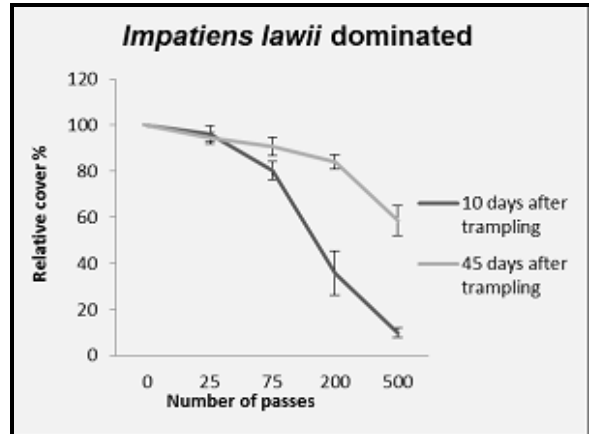


Fig. 2

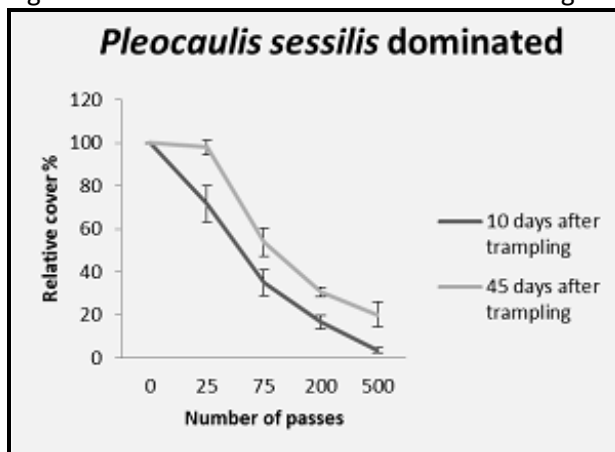
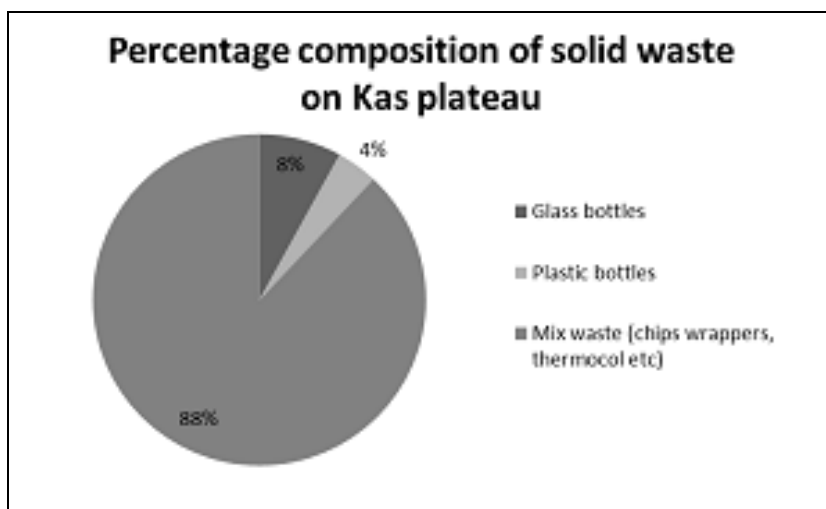


Fig. 3

In 2012, when we started the project, we divided the entire plateau into 100 m X 200 m grids using a GIS software and, in each grid, we laid 1 m X 1 m plots systematically. These plots were monitored twice in that season to record species richness and diversity of herbaceous plants and percent bare ground in each plot. However, due to construction of barricades on the plateau, the trampling was concentrated in certain parts of the plateau only, and our data did not answer the question we had set out for. The following year, we first sampled for tourist density and prepared a tourist density map. Based on this map, the plots were laid, and data was collected in control and trampled areas. The data is currently being analysed.

**b. Solid waste management model:** An important outcome of this project has been the implementation of a solid waste management model which involved the three key stakeholders of the plateau– local communities, the forest department and the tourist organisations. After discussions with the waste pickers, the main problems in managing the waste were identified as: a) long time storage of waste near the plateau was not feasible; and b) regular transportation of the waste to Satara city costs Rs. 300/- per trip (approx. £3), which exceeds the earnings made after selling the segregated waste (~Rs. 200/- in 2012 season)

Keeping this in mind, the present model was developed on the lines of citizen's initiative, which worked successfully in the season of 2013 (– the indicator being regular collection and proper disposal of waste). In 2012, waste was collected by JFMC members and piled in dense forest areas and later burnt on the spot for lack of transport/recycling facility. But in 2013, based on our ground planning for zero-waste, the JFMC members collected, segregated and filled the waste in gunny bags provided by us. These bags were then transported till the nearest city by tourist organisations on their way back from the plateau, which in turn entered the recycling unit. In addition, the Satara Forest Department has promised to acknowledge the help of volunteering organisations on the official website of Kas plateau and continue this on a long-term basis.



A total of 415 kg of waste was segregated and transported till Satara city in 2013. 88% of the total waste comprised of chips wrappers, which is a matter of serious concern as these are not recycled in the local market. Three organisations, namely, Pugmarks Ecotours, Pune, Foliage Outdoors, Pune and Nature India Team, Mumbai volunteered and carried the waste back.

### c. Stakeholder interactions:

**Local communities:** I, along with my team, were part of two capacity building workshops organised by the Satara forest department, in June 2012 and July 2013 respectively, with around 45 participants from four villages in each workshop. As an outcome of the training workshops, 10 trained local men currently work as tourist guides on the plateau. A documentary film has been developed as training material for the guides as part of this project.

Four villages are part of the 'Kas plateau Joint Forest Management Committee' (JFMC). We have visited each village twice, to interview both men and women, to understand their perceptions towards the plateau. The results of our semi structured interviews show that most villagers are not aware of the meaning of a World Heritage Site. When asked of what the plateau means to them, the popular answer we received was that earlier it meant only a grazing pasture for them, where they can take their cattle. But after the onset of tourism, most locals view the plateau as an income generation source and are keen to conserve the plateau. We have also documented the religious value of some plants and their local names through discussions with the villagers. The next planning for local community sensitization is being designed based on these findings.

**Tourist interviews-** A total of 198 structured interviews were conducted with the visitors. Our findings with the tourists were very crucial to implement certain alternative livelihood options for the locals. 62% of the respondents chose homestay as their preferred choice of accommodation over a resort (30%). Most respondents would prefer an interaction with a local nature guide (46%) over a field book for flower identification (21%), while some opted for both the options (17%) and few for none (16%). Based on these findings, we have helped a local set up a homestay in Kas village and conducted training workshops for the local guides.

**Forest department:** All through the course of the project, our team has constantly been involved in working of tourism management on field with the Forest Department. This has paved the way for a good rapport amongst us, which, we hope, will help us in implementing practical solutions to combat the current ecological impact of mass tourism at the study site.

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

Engaging with the local communities formed a significant part of the project. The local communities have benefitted from the project in the following ways-

1. **Eco guides:** Two training workshops were organised with support from the Satara Forest Department so that the local youth are able to identify the plant species, develop their communication skills and be sensitive towards conserving the native plant populations. DVD copies of a documentary film developed as training material were circulated among all the locals working on the plateau. Tour companies from cities are being encouraged to hire these local guides on their trips to Kas plateau. I was felicitated by the State Forest Minister for conduction training sessions for the local guides and contribution of valuable information for a flower identification booklet developed by the forest department.
2. **Solid waste:** The waste collectors were sensitised towards environmental and health hazards of burning the waste, and they willingly undertook training for segregation and proper disposal of waste. Hand gloves were distributed to the waste pickers to encourage better ways of segregating waste. Waste is now being segregated and stored away from the plateau. Important linkages and network have been built between the local communities and tour operators, to facilitate regular disposal of waste with the help of tour operators.
3. **Homestay:** Through monthly visits, we helped a local person set up a homestay in his village. During these visits, we provided inputs on waste segregation set up, itinerary for the visitors, decoration of the homestay to enhance the rural experience. Once the homestay was ready, a visit was organised for the Forest Department officers and the director of a leading tourist organisation to the homestay, to develop important linkages.
4. Through discussions with the villagers, we have been able to understand their perceptions towards protecting the plateau. In addition, opinions from the women folk, who rarely visit the plateau, were taken as well. Efforts are being made to create awareness among the villagers towards the fragility of the habitat, and the importance of conserving the plateau in its natural state.



## **5. Are there any plans to continue this work?**

Yes, we plan to apply for further funding to continue this work. We would like to regularly monitor the vegetation plots to check for species recovery after they were subjected to trampling treatment in the last season. This will widen our understanding of the habitat and equip us with information to provide suggestions to the concerned authorities to reduce the negative impacts of tourism. Forest department and other concerned authorities have acknowledged our efforts and contribution in better planning for conservation tourism. They are keen to interact and incorporate suggestions based on our regular monitoring and research findings. This is extremely important and will go a long way as a major conservation effort, where researchers partner with the government and local communities for better and more scientific action research.

While the solid waste management model has been a positive outcome so far, we would now want to focus more on creating awareness among the tourists to reduce waste deposition in the first place. Although all necessary public policies and laws against public disposal of waste are present, implementation is often faulty, and that is where we plan to contribute with novel approach to citizen partnership. Our future plan is to design low impact guided tours on the plateau, sensitisation of the tourists and developing a scientifically designed tourist movement plan for the place, without compromising on the experience of the visitors, through involvement of the stakeholders. This will be the focus area of the future project.

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

The findings of the study have been regularly shared with the Forest Department in the form of a report and presentations and this will continue. We will conduct a meeting with the JFMC members in the near future to disseminate the results of the study so far. We plan to publish the key findings in peer reviewed scientific journals. In addition, four magazine articles and five newspaper articles (in English and Marathi) were written during the course of the project and some more are being written in near future. We are working on a blog and a website for the project so that it has a web presence and reaching out to people becomes easier. Apart from this, the project involved a volunteer force of 18 university students, who got thorough training in ecological and social aspects of conservation planning. Most of these students work on a part time basis with tourist organizations who organize tours to Kas plateau and similar such areas, and one of the reasons of having them as volunteers was to reach out to a larger visitor group through them.

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

The RSG was used from September 2012 till December 2013. The project length extended by 5 months as compared to the anticipated duration of the project, since we had to wait for one entire flowering season to understand the altered tourist movement as a result of construction of barricades before doing a systematic vegetation study the following year. In addition, the solid waste management model was implemented in the 2013 season after studying the waste situation in 2012.



**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
Subsistence for local team (two field assistants)	560	560	0	
Fuel at 5 litres per day	1300	1141	159	
Local travel (Bus transport, auto rickshaw)	188	137	51	
Hire of four-wheeler	250	250	0	
Rental and living costs	1170	1381	-211	Due to an extended field period, it led to an increase in rental and living costs. Data collection was done over two flowering seasons, instead of the earlier planned one season sampling.
Basic Camera for documentation	133	264	-131	The initial idea was to purchase a camera only for documentation purposes. But we later decided to make a documentary film as well, for which a slightly better camera was required with HD recording. We thus bought a Nikon P510, using the funds saved from other heads.
Vegetation sampling apparatus	94	137	-43	The reasons for using more funds than planned under this head were an extended field season and damage to equipment due to heavy rainfall, as the peak flowering season is in the monsoon season
Umbrellas and rain wear	20	64	-44	We had budgeted for rainwear for the project team. However, after spending time on the plateau, a good rapport was developed with the local communities and the Forest department. Since Kas plateau is a high rainfall area, the field conditions are very tough. To help them combat the rough conditions, rainwear was distributed to 20 local community representatives and 7 forest department guards working on the plateau during the tourist season. In addition, rainwear was provided to the project volunteers. Hence, it exceeded the planned amount
GPS	200	184	16	
Capacity building workshop	63	2	61	Both the training workshops were funded by

				the Satara Forest department.
Hire of LCD	20	0	20	LCD was provided by the Satara Forest department
Ecotourism basic tool kit for trained nature guides	53	54	-1	<p>The initial idea was to give a kit which included a booklet, water bottle, notebook, pen and bag. After discussions with the locals, we realised that they already had the above-mentioned material. An interactive training material was thought to be more beneficial to meet our objective. A documentary film was hence prepared as a training material for the guides. It covers the biodiversity of the plateau, key information to be given to the visitors about the plants and ends with a strong conservation message. The funds under this head were used to give honorarium to young professionals who helped with the script of the film, translation in the local language and provided narration. 50 DVD copies of the film were distributed among the trained guides, JFMC members, forest department officers and local restaurants that screened the film for visitors.</p> <p>A pictorial field guide of common, rare and endemic plants of Kas was also published by the Forest Department, for which we contributed information of plants in Marathi, the local language. Copies of this were distributed free of cost by the forest dept., to the trained guides</p>
Material development (posters and pamphlets) for sensitisation of tourists	135	8	127	<p>Some funds were used to prepare a poster on the solid waste management model, which was widely circulated via email and Facebook to the tour operators.</p> <p>Pamphlets and a field notebook on Kas plateau were prepared by the Satara Forest Department, for which I have contributed information on the plants. For the next flowering season (year 2014) we plan to make use of the web for sensitisation of visitors by creating a project website and circulating awareness pamphlets via social networking sites and e-groups.</p>
Internet USB dongle	20	19	1	
Communication (phone and internet)	160	176	-16	

Stationary	40	36	4	
Photocopy and print	48	60	-12	
Postage and courier	25	13	12	
Honorarium for researcher	1440	1440	0	
Miscellaneous	66	59	7	Funds were used for field vehicle maintenance, and to purchase books- Flora of Maharashtra and a Grass book which were necessary to identify the plants
Total	5985	5985	0	1-pound sterling ~ 87.92 Indian Rupees

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

Currently, the biggest challenge at hand is to manage very large densities of tourists (highest recorded 30000 per day by local nature watch groups) visiting the plateau every day, in a sustainable way. To achieve this objective, I feel the following would be the important next steps-

1. **Carrying capacity-** Studies are needed to calculate the visitor carrying capacity of the plateau, and visitor should be restricted, both spatially and in numbers, based on this data.
2. **Designated paths-** To regulate tourist movement, properly planned designated paths should be made, and the tour should be led by a trained local eco guide. Signage and information boards must be put up at strategic locations all along the designated paths aimed at educating the visitor about the biodiversity of the plateau and the need to conserve it.
3. **Solid waste management-** To address the problem of solid waste, the plateau must be declared as a No Plastic Zone, and there should be check posts to stop visitors from carrying any eatables. At the same time, there is a need to create awareness among the masses about the negative effect of littering of waste.
4. **Outreach-** After interactions with the tourists over two flowering seasons, we sensed a general lack of awareness amongst most of them (especially the tourists who come on their own, without nature companies), regarding the importance of biodiversity of the plateau, the uniqueness of the habitat and the need to conserve it. Most were not even aware that the flowers were wild and not cultivated! Hence, a significant part of the future project will be to sensitise the visitors.
5. **Impact monitoring-** Long term monitoring of impact of tourist activities on vegetation and other taxa is necessary to take informed decisions for managing the plateau.

### 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?

Yes, the RSGF received wide publicity during the course of the work. RSGF logo was used in the following events and articles

- 1) PowerPoint presentations made to the state Forest Department and district Forest Department, the local communities and the tourist groups.
- 2) Poster presentation at Indian Biodiversity Congress, Bangalore, December 2012.
- 3) Certificate of participation given to the volunteers. In addition, while conducting tourist interviews, the volunteers wore badges which had RSGF logo.

- 4) RSGF logo is included at the start in the documentary film developed as training material for local eco guides.
- 5) Project update document given to Mr Ram Bhooj, UNESCO member.
- 6) Reports/ Letters submitted to the State Forest Department and District Forest Department.
- 7) RSGF logo was printed on the hand gloves given to the waste pickers and on the raincoats distributed to the JFMC members.
- 8) RSGF was mentioned in all the pamphlets and posters, magazine and newspaper articles published as part of the project.
- 9) RSGF was mentioned while giving interviews to television channels (national channel-Doordarshan and local channel-IBN Lokmat) and on radio (Radio mirchi 98.3FM).

#### **11. Any other comments?**

Our team has been present in four meetings conducted by local NGOs and weekly JFMC meetings held on the plateau to discuss management strategies of the plateau. This includes meetings held before (April 2012) and after one year (May 2013) of declaration of Kas plateau as a UNESCO World heritage site, which was attended by representatives from UNESCO India, local communities, Satara Forest Department and local NGOs.

I have been regularly updating the Satara Forest Department with the progress of the project through monthly visits to the office, emails, letters and presentations.

The grant recipient would like to thank Satara Forest Department, Kas plateau JFMC and Biome Conservation Foundation for help and support to meet the objectives of the study and RSGF for financial support.