

## The Rufford Foundation

### Final Report

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Congratulations on the completion of your project that was supported by The Rufford 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**

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#### Grant Recipient Details

<b>Your name</b>	Gugulethu Tarakini
<b>Project title</b>	The little known pollinator species in agricultural intensive regions of Zimbabwe.
<b>RSG reference</b>	26204-1
<b>Reporting period</b>	22 November 2018- 22November 2019
<b>Amount of grant</b>	£4984
<b>Your email address</b>	<a href="mailto:gugulethu.ncube92@gmail.com">gugulethu.ncube92@gmail.com</a>
<b>Date of this report</b>	22 November 2019

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
Understand farmers perceptions, knowledge, and attitudes towards bees.				Questionnaire survey was conducted, and findings have been sent to the Journal of Tropical Conservation Science. Farmers were generally not aware of other bee species, and most knew honeybee. The next step was therefore to expose them to other bee species in their environment.
Local community awareness on pollinators and their conservation.				Farmers were involved in the assessments of intercropping versus monoculture systems in terms of bee abundance and diversity. Farmers participated in cultivation of the vegetable gardens and monitoring of bees in the different systems and got to learn of other bee species in their environment. Farmers enjoyed the practical exposure to the processes of pollination which some were not aware of. Other techniques to conserve bees such as the idea of pollinator gardens was promoted to the farmers.
Assessments of the feasibility of bee keeping for pollination.				Farmers were involved in beekeeping practices for pollination, with 12 beehives strategically placed in fields and some in forests to assess rate of colonisation. The project was successful with five out of the 12 hives colonised in the 1-year period and farmers learnt the importance of proper site choice in bee keeping as well as the impacts of cultivation on bees as early colonisation was for hives in natural forests.
Inventory of bee species in Zimba district.				Bee species visiting the gardens were observed and recorded. Samples which could not be identified in the field were captured for later identification in the lab. There are still some bees yet to be identified as taxonomy in bees is still a challenge with some families not having keys. The identification process is still being organised to be conducted in South Africa where there are bee taxonomists.

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

Difficulties that the project experienced were of lack of water. The water sources for watering gardens dried up early as such it affected crop growth. Water for the gardens at the final stages of the project had to be sourced at greater distances and very early in the morning which was quite challenging such that some gardens were drying.

Secondly, the gardens being in the community, two were partly eaten by goats which forced themselves through the brush fencing during the flowering period. We however, had to continue monitoring bee visitations and made sure number of flowers are counted in each blanket to block for this difference.

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

**(a) Inventory of bee species in Zvimba district Zimbabwe**

The project managed to record observations of bee species in the community visiting gardens. This is important information which is currently lacking in the country and has made it difficult to understand if the species are decreasing or increasing (trends). This information will be used as baseline data for monitoring bee populations going forward so as to inform policy makers and public.

**(b) Local community capacity building and awareness creation**

Local communities were involved in assessing agricultural techniques best for pollinator conservation. Local communities came to learn of other bee species and awareness to pollination services through day to day interaction with bees in their flowering gardens that they had created with the project. The farmers also came to understand the importance of bee keeping besides honey production and the importance of conserving natural forests as most beehives which were colonised by bees were in forests compared to those in fields. This practical experience and exposure to the process of bee keeping for pollination which is rare in our country was appreciated by farmers.

**(c) Research and communication of project works**

The project surveyed perceptions, attitudes and awareness of pollinators for the purpose of conservation. The manuscript has been sent for peer reviewing in the Journal of Tropical Conservation Science. Bees identification ability was very poor in the area which paused the question of how they can conserve what they do not know hence need for awareness campaigns highlighted. Secondly, despite importance for bees, few beekeepers were found in the area and majority of farmers who were not practising bee keeping highlighted fear of bees as a major reason. This showed that fear was a major barrier for bee conservation and needs to be dealt with for successful adoption of bee conservation technologies. This work has also opened networks with agricultural extension officers for future collaborations. Extension farmers assisted in conducting questionnaire surveys.

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

Local communities were involved in beekeeping, those who had not been trained got training in the process. 12 beehives were installed in the communities, six in the fields and the other six in natural forests. Farmers were involved in the installation of the beehives and data collection process.

Farmers were also involved in the creation of vegetable gardens which are monoculture as well as diversified. The farmers learnt how to form a diversified garden which offers diverse forage for bees and can attract varied bee species. Through this concept farmers came to learn about pollinator gardens, which they can create as an investment towards bee conservation especially during seasons where there isn't much forage for bees in order to improve conservation of their bees.

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

Yes. The project would like to further assess alternative forage resources for bees by surveying live fence trees which communities can adopt as bee forage seemed to be diminishing with expansion in agriculture.

Furthermore, with the current baseline inventory of bees in the community, the project plans a continual yearly survey of the bees using the same simple techniques so as to monitor bee trends over time for an understanding of the status of bees (if they are declining or not).

The project would further assess the concept of beekeeping for pollination as in the current study it showed that it's possible though it needs to be improved according to local conditions if 100% success in beehive colonisation is to be achieved. The project would therefore further assess directions to be faced by beehive directions as well as design of beehive (modern designs versus traditional designs).

The project also plans to use networks established with extension officers to do more awareness campaigns. The plan would entail capacitating extension officers on pollinator conservation techniques so that they can disseminate information to their different wards by so doing reaching more farmers.

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

Finding on the perceptions, attitudes, awareness of farmers on pollinators were presented at the TWAS SAREP Regional Conference for young scientists in Kenya (October 2019) as well as at a Community Conservation Science Workshop in Victoria Falls Zimbabwe (November 2019).

Manuscript has also been submitted to the Journal of Tropical Conservation Science for publication.

I am also attending the Rufford Conference in Zambia which is from December 7th-8th 2019.

The full report of the work and findings will also be submitted to the District administrator, Chinhoyi University Library, Agricultural extension officers (supervisors in the district).

**7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?**

The project field activities were completed over the planned 12 months period. The only thing remaining is compilation of full report as well as identification of some bee species in South Africa.

**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
Enumerators	1360	983	-377	Took the balance to cover transport expenses and the remaining 10.8 was used to cover printing costs.
Printing	102	349	+247	Was covered by 10.8 balance from enumerators and 236.2 balance from equipment.
Equipment (camera, beehives, seeds for vegetables)	565	329	-236	Took the 236.2 to cover printing costs
Transport	2957	3323	+366	We took money for budgeted for food and accommodation and used it for transport as it became cheaper to travel to the sites on field days than camping there.
<b>Total</b>	<b>4984</b>	<b>4984</b>		<b>Rate 1£=1.25US\$</b>

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

For effective bee conservation, the following two issues need to be addressed.

Number 1: Awareness is still needed.

Awareness programmes to also improve from traditional methods of workshops as limited numbers attend and begin to use media such as radio, television,

newspapers, WhatsApp and other social media platforms. Incorporation of visual arts in pollinator awareness programmes.

Number 2: Information on the status of pollinators is not available making it difficult to influence policy and focus conservation activities. Standardised data collection methods are necessary for continued data collection of species throughout the country for continued monitoring of trends.

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

Yes, the Rufford logo was used in power point presentation of the work at the community conservation workshop.

The logo was also used in the poster presentation at the Conference in Kenya.

Full acknowledgement for the funding support was also made on the manuscript submitted to the journal of tropical conservation science.

The logo and acknowledgements of the Rufford foundation will also be made in the final project findings report, presentations in the conference or talks envisaged and any other publication which may emanate from this work.

**11. Please provide a full list of all the members of your team and briefly what was their role in the project.**

**Professor Robert Musundire**, assistance in project design, analysis of results and manuscript writing were greatly appreciated.

**Dr Abel Chemura**, guidance in sampling as well as data analysis and manuscript writing was greatly appreciated.

**Donny Sithole** was a field research assistant with Vincent Uta and their assistance in conducting questionnaire surveys and bee observations was greatly appreciated.

**12. Any other comments?**

My greatest appreciation goes to Rufford Foundation for their financial support which was critical for the success of this project.



Pinned bee samples for identification



Caging bees to monitor foraging behaviour.

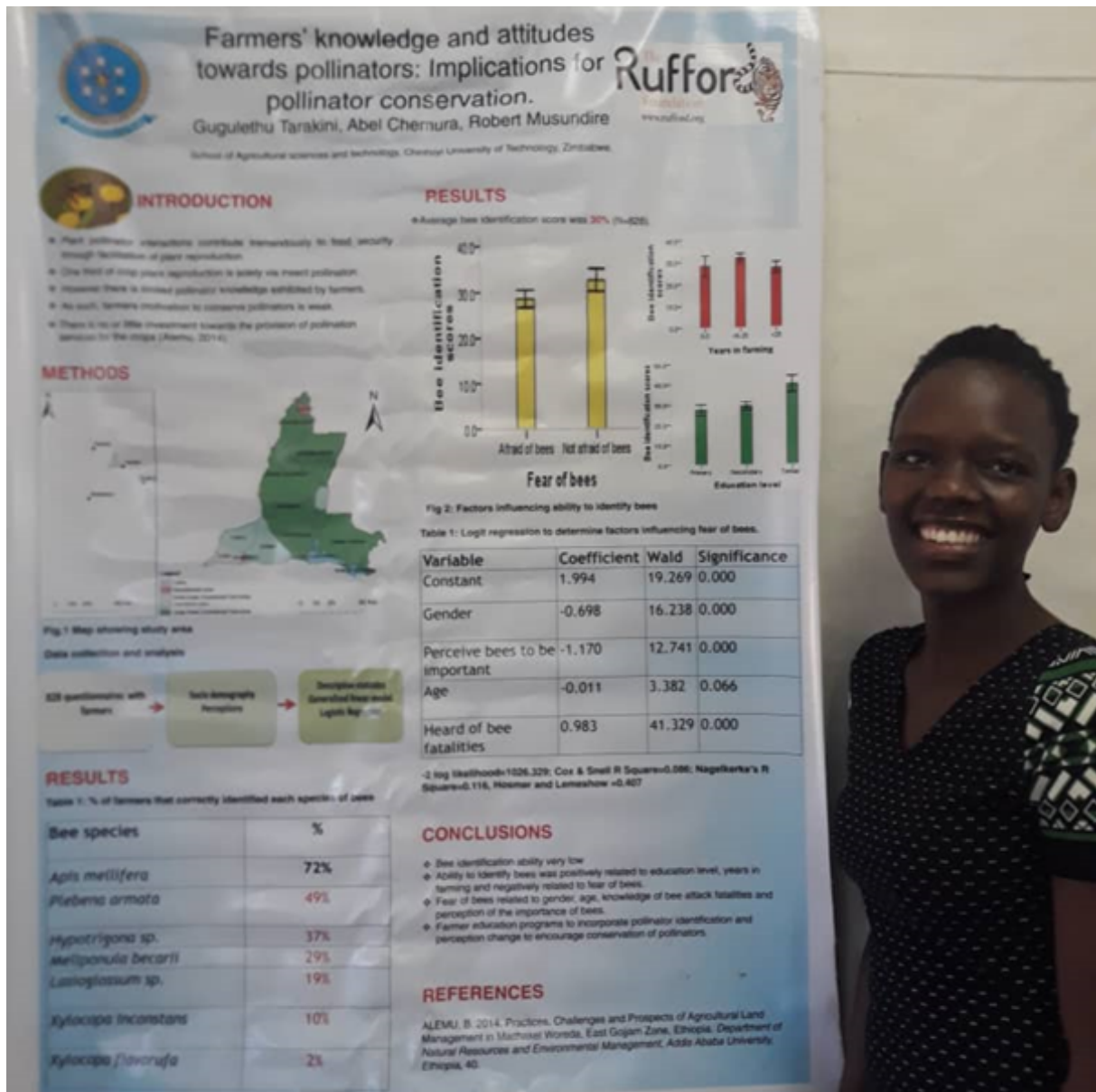


Vegetable garden demonstration plot for monitoring bee abundance, diversity and foraging.



Presentation findings at a Community conservation workshop in Victoria Falls





Poster presentation of findings at the TWAS SAREP Regional conference for young scientists in Kenya.



Bee hives sited to monitor rate of colonization in different landscapes