

Final Evaluation Report

Your Details	
Full Name	Gerald Keneth Kaniaru
Project Title	Community-Based Conservation of Locally Threatened, Medicinal <i>Securidaca longipedunculata</i> (Violet plant); for the people, by the people in the drylands of Kenya
Application ID	29804-1
Grant Amount	£5,987
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Date of this Report	30 th March 2021

1. 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
<p>1. Strengthen capacities of community groups and schools through outreach and education.</p>				<p>1.1. 114 local community members trained in groups of 10 to limit the spread of Covid-19.</p> <p>1.2. 71% of women trained and apply new skills as compared to 29% of men. Women are the primary users of the target species for medicinal purposes and other household activities such as firewood and charcoal burning.</p> <p>1.3. School pupils not involved through the closure of schools as part of Covid-19 containment measures imposed by the Kenya Government. However, this was compensated by additional adults that were directly involved in the destruction of the medicinal <i>S. longepedunculata</i> species and their habitats.</p>
<p>2. Solve propagation difficulties of the violet plant utilized consumptively for medicinal purposes by the community through research.</p>				<p>2.1. 100% germination rate of <i>S. longepedunculata</i> seeds were obtained at a percentage moisture content of 35±1%.</p> <p>2.2. <i>Securidaca longepedunculata</i> seeds classified as recalcitrant seeds after seed quality studies.</p> <p>2.3. Vermiculite was found to be the best media for the propagation of <i>Securidaca longepedunculata</i> seeds.</p> <p>2.4. Guide to Seed Collection, Processing, Germination, Propagation and Nursery Practises of the Medicinal <i>Securidaca longepedunculata</i> produced, distributed to the local community and other stakeholders and used to train the local community during a community meeting.</p> <p>2.5. Optimum time for seed collection achieved through seed testing of maturation period of <i>S. longepedunculata</i> seeds to achieve high germination rates for restoration.</p>
<p>3) Restore the viable populations of this species and</p>				<p>3.1. 1784 propagated <i>Securidaca longepedunculata</i> seedlings restored in collaboration with JAPEL Self-Help Group</p>

<p>the integrity of its habitat through mass propagation and reforestation</p>			<p>members and the local community. 3.2. Over 1450 <i>Securidaca longepedunculata</i> seeds planted through direct seeding in collaboration with JAPEL Self-Help Group members and the local community. 3.3. Agroforestry was used as a restoration technique to ensure that the local community domesticates and protects the target species against destruction.</p>
<p>4. Information dissemination of project findings through print and non-print Media.</p>			<p>4.1. Four short video documentaries produced and used as educational products for training and outreach. They include: -Degraded and Fragmented Medicinal Violet Plant Habitats in Makueni drylands of Kenya - https://youtu.be/Y0kwJ7g5rjk -Dried Upper watershed sites and Seasonal River streams in Makueni drylands of Kenya - https://youtu.be/K709DUvViDM -Threats facing the violet plants and their habitats in the Makueni drylands of Kenya https://youtu.be/vUk-k7yIDuE -Medicinal Violet plant: Seed Collection, Breaking Seed Dormancy, Propagation, Community Training and Restoration - https://youtu.be/i7Mi75UKNxI 4.2. Propagation protocol manual produced and disseminated to the local community. A sample booklet is available online via the link below: https://ruffordorg.s3.amazonaws.com/media/project_reports/29804-1_Promotional_Materials.pdf 4.3. Publishing of the project findings in peer-reviewed journal on-going.</p>

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

Cessation of movement imposed by the Kenyan Government disrupted some of our fieldwork expedition timelines and limiting access to project expendables and non-expendable supplies. However, the team had to adjust the project timetable and put extra man-days in the field.

School pupils were not involved in the training sessions as indicated in the project document as the schools were closed until further notice due to the Covid-19 pandemic. Interactions with them were discouraged by the government as they were classified as a vulnerable group. However, additional adults who pose a direct

threat to the target species existence replaced them.

During questionnaire administration and interviews, some of the local community members were unwilling to cooperate with the project team members due to the perception of transmission of Covid 19 infection from urban areas where the project team resided in the rural areas. The project team distributed face masks to the local community members interviewed and sanitised them during and after the exercise using an alcohol-based sanitiser.

Some of the local community members were hostile during interviews and questionnaire administration due to the feeling of their time being wasted. The project team decided to facilitate uncooperative community members using the participant incentive budget line to ensure that information is recorded for as many people with knowledge on traditional medicine as possible.

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

- Increased germination rates of *S. longepedunculata* seeds that have been proven in the past to be difficult to propagate by seed: Previous studies on the methods of successful propagation of *Securidaca longepedunculata* Fresen species through seeds have been documented not to exist globally (Zulu, et al., 2011). Ex-vitro germination rates of the target species have shown not to exceed 43% as compared to 67% - 90% in-vitro germination rates (Zulu, et al., 2011). This project has demystified this by increasing ex-vitro germination rates of the species through seeds to 100%. Moreover, it has established the best media for propagation of *Securidaca longepedunculata* as recommended by Zulu et al (2011) study.

Additionally, the project has been able to unravel the seed biology of *S. longepedunculata* species: morphology, seed storage behaviour, viability and longevity which was unavailable in literature.

- Most importantly, the awareness created through education and outreach. JAPEL Self-Help group and other local community members received the information passed using the various project outreach and information dissemination pathways applied new skills and possessed the desired attitude and awareness on the benefit of the target plant species, seed collection, processing, propagation, restoration and protection of its habitats.
- Documentation of the threats facing *S. longepedunculata* species and their habitats. This will inform the project in developing conservation and restoration strategies for the protection and restoration of these habitats

4. What do you consider to be the most significant achievement of this work?

The ability of JAPEL Self-Help group and other local community members to implement the training module, distinguish immature and mature *S. longepedunculata* seeds, apply new skills trained and effectively protect and

restore the target species and their habitats against extinction stands out for the project team.

5. Briefly describe the involvement of local communities and how they have benefitted from the project.

At first, they were involved in project planning and afterwards trained on:

- Benefits of protecting violet plants habitats through community forestry model.
- Sustainable use of the plant.
- The optimum time of seed collection to achieve maximum germination.

Additionally, they were involved in seed collection, propagation and restoration of the violet plant in collaboration with the project team.

6. Are there any plans to continue this work?

Subject to constraints raised by the community in the conservation of medicinal plants in the area such as:

- i. Low successes in the propagation of medicinal priority tree species in the past due to a lack of information and skills, inadequate water supply to water tree seedlings for restoration thus curtailing seedlings production and restoration efforts in the area as rainfall is unreliable in the area.
- ii. Lack of incentives from the conservation work thus channelling efforts towards growing food crops.
- iii. Social perception: Due to the high illiteracy levels in the area, some members believe in the existence of precious stones that can be commercialised beneath certain plant species such as *Dodonaea angustifolia* resulting in uprooting most of the species in search of the precious stone.
- iv. There are wide knowledge gaps in Information on medicinal plants diversity, use, mode of application and administration from the old to the young as it is considered witchcraft.
- v. Lack of economic tree species to be used for timber, firewood and charcoal burning thus resulting in exploiting native species in the wild.
- vi. Inadequate facilities such as non-mist propagators and community tree nurseries to propagate seedlings hence reliant on traditionally made nurseries.

There is a need to continue this work to solve these constraints through:

- a. Further seed testing research crucial to guide the local community in the storage and planting of the medicinal priority species. More propagation protocols for other medicinal plant species produced, published, distributed and used to further educate the local community.
- b. Rainwater harvesting system through the installation of water tanks managed by the self-help group will provide water for the growth of the planted seedlings thus limiting seedling loss due to desiccation.
- c. Support to biodiversity value chains such as honey and economic tree seedling production and commercialisation would ensure that the women are empowered economically thus motivation to propagate and restore more species through funding from the biodiversity products.
- d. More workshops and training sessions should be organised and implemented to demystify the false social perception with facts and to pass knowledge on the importance of conservation of biodiversity on the study area.
- e. Identify and document traditional indigenous knowledge on medicinal plant species, distribution and abundance useful for culture and heritage preservation, biodiversity protection, conservation and restoration
- f. Mass propagation, planting and commercialisation of economic tree species for timber and firewood production will ease the pressure off the natural indigenous forest from further destruction.

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

1. Distribution of project generated propagation protocol booklets.
2. Sharing short video documentaries link to a wider audience and prepare the short video leaflets for dissemination to the local community.
3. Publication in a peer-reviewed journal.
4. International Conference: I plan to present the results of this work during the 22nd AETFAT Congress Livingstone 2022 Diversity and Conservation of African Plants: Challenges and Opportunities which will take place from 21st – 25th March 2022 in Livingstone, Zambia.

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

One year period and in line with the anticipated length of the project.

9. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Outreach and Education materials	542	542		Project administration and Training materials
Stationery	152	152		Notebooks, pens etc.
Equipment	614	614		Propagators, Nurseries, Growing media such as vermiculite, sand, sawdust and Nursery equipment
Institutional Overhead Cost	758	758		Paid to National Museums of Kenya as the host institution'
Vehicle Hire +Fuel cost	1221	535	-686	Uber+ Public transport used to minimise expenses of vehicle hire and fuel costs. Additional funds directed to support more field expeditions.
Subsistence allowances + Food Expenses	2700	3386	+686	Additional funds from Vehicle Hire+Fuel cost budget line to support more field days.
TOTAL	5987	5987		
£1=Ksh 131.88888 (InfoEuro December 2019)				

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

Apart from *Securidaca longepedunculata*, other wild medicinal plants in the area were unsustainably harvested and prepared to treat different ailments from mild coughs, venereal to even lethal health conditions such as diabetes, HIV/AIDS and cancer. During our fieldwork expedition, two families were found to be infected with COVID-19 and are using the medicinal plants as a remedy and based on their report, they are recuperating well. There is limited access to medicine and palliative care services due to high poverty levels and ease of access to traditional medicine in the area. Traditional knowledge of Kamba community living in the study area - one of the driest and marginalized parts of Kenya is untapped with no documented reports or literature on wild medicinal plants and their use in the area.

The wild medicinal plant habitats in the study area which is currently non-protected are highly fragmented due to consumptive exploitation of plants for medicine by the local community, firewood harvesting, charcoal burning, overgrazing and over browsing by livestock, the encroachment of the forested areas for settlement,

habitat conversion to farmlands and Infrastructure development such as the building of dams as shown in the final project report. These activities have led to the development of seasonal dry streams due to deforestation at the upper water catchment areas and the opening up of these forested habitats thus fragmenting them into small, isolated wildlife populations decreasing the evolutionary fitness of the species in these populations. This makes these habitats unsuitable to support viable animal and plant populations due to inbreeding effects.

This necessitates the need to take urgent steps such as:

1. Identify and document traditional indigenous knowledge on medicinal plant species distribution and abundance useful for culture and heritage preservation, biodiversity protection, conservation and restoration.
2. Integrate and train more community focus groups to protect, conserve and restore medicinal plant species and their habitats.
3. Restore the degraded and fragmented habitat patches of selected wild medicinal plants.
4. Empower the local community economically through biodiversity value chains such as beekeeping and commercial tree seedling production.
5. Disseminate project findings and information using project generated educational materials such as leaflets, booklets, reports, propagation manual and publication for awareness creation and education.

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

The Rufford Foundation logo was used in the production of propagation manual booklets, final reports and presentations. The Rufford Foundation has also been acknowledged in all the short video documentaries on the description box and through tagging of the Rufford Foundation logo at the end of each video.

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

Gerald Kaniaru: Project Principal Investigator; Lead role in seed collection, propagation, seed quality studies, taxonomy, community outreach and project management

Collins Masinde: Project team member 1: Lead role in Plant Taxonomy; Modelling of restoration sites away from threat prone areas.

Jonathan Sila: Project team member 2; Lead role in conducting need assessment and organizing community training and workshop

Cecilia Alinda: Project team member 3; Lead role in Natural Resource Management and information dissemination.

Dr Samuel Kiboi: Project advisor. Advises the project team throughout the project implementation period from community work to research.

Other cross-cutting roles include:

1. Project planning
2. Designing and adjusting project timetables especially in periods of lockdowns and cessation of movements.
3. Training of the Self-Help group and the local community.
4. Budget allocations to various project activities.
5. Report writing and submission

13. Any other comments?

Understanding of medicinal plants provides new avenues in drug development especially for lethal diseases such as cancer, diabetes and the Covid-19 pandemic among other ailments where medicinal plants have been and still are used by the local community to control them. For example, *Artemisia annua* was used in the development of antimalarial drugs among others. This is possible through the isolation of bioactive ingredient, evaluation of their efficacy, toxicity levels in the medicinal plants and thus the need to document the diversity of these medicinal plants, the disease they cure, dosages and mode of preparation and administration. Rufford Foundation has given us a chance to make our contribution to the betterment of this world and we are utterly grateful as a team.