CRITICAL ECOSYSTEM PARTNERSHIP FUND

CEPF Final Project Completion Report

Organization Legal Name:	Biodiversity Conservation Madagascar
Project Title:	Long-term Fire Management to Protect Beanka Protected Area in Madagascar
Grant Number:	66083
CEPF Region:	Madagascar and Indian Ocean Islands
Strategic Direction:	1 Empower local communities to protect and manage biodiversity in priority key biodiversity areas.
Grant Amount:	$119,633.00
Project Dates:	July 01, 2016 - July 31, 2019
Date of Report:	November 06, 2019

Implementation Partners

List each partner and explain how they were involved in the project

The first partner to launch the project was the local community. From the beginning of the work to the end. These communities are directly affected by the direct effects of the project and we have had to cooperate with them. Although long-term fire management in dry areas is difficult because, the long drought period, facilitates the fire spread. Additionally, as the general characteristics of the forest are deciduous and dry, a common firefighting strategy has therefore been established and developed with the commitment of the communities living around Beanka. However, the Regional Representative of the Environment and Forest Ministry (abbreviated as DREDD) of Melaky is among the partner involved in the protection of the environment especially the the long term fire fignting program. Thus the project was carried out in collaboration with DREDD Melaky and the local communities.

Conservation Impacts

Summarize the overall impact of your project, describing how your project has contributed to the implementation of the CEPF ecosystem profile

- 1.Building community capacity around the Beanka NPA and , discussion and drafting of the document with the active contribution of the communitiesof the social contract governing the long-term management of natural resources, involving 5 Regional Environment and Forest

Department representatives of Melaky, the BCM local team and the communities trpresented by representatives from eight associations over 8 large villages;
- 2. From 2017 to 2019, 12.8 km of firebreak created;
- 3. In summary, 3.820 km firebreak and 2.320 km plant buffer maintained from 2017 to 2019;
- 4. As a result from 2017 to 2019, 24 805 of indigenous plants and 42 752 tamarind plants planted in the degraded/cleared habitats and fire break respectively;
- 5. 48 posters posted (4 different models) of A2 format related to firefighting, in seven sites frequented by residents, roads and pathway . Creation of firefighting strategy and fire management accompanied with socio-development project module (17 pages) explained and distributed to the 8 local association representatives in Beanka.- 6. In general, survival rates were estimated to be 15 percent;
7. Honey production in two villages(Ambinda and Ankilimanarivo) through the use of farm hives continues. During the first quarter of this year 2019, the hives were observed, the empty ones are filled by two trained field officers employed by BCM. 18 new hives are distributed during the second quarter of this year. A total of 38 hives were distributed during the project. An estimated volume 95 liters of honey were produced during the first half semester of 2019;
9. The family planning activity continued and currently carried out in 10 large villages. During the first quarter of this year 2019, the project was conducted in 9 villages : Ankiranomena, Ambinda, Vohimiary, Ambalabao, Maperabe, Andranogidro, Ankilimanarivo, Mangabe and Mandeharira. Out of the women in the villages, the number of women receiving family planning was 64. During the second quarter (2019), the activity consisted firstly in raising awareness in Mandeharira and Maperabe, 85% of reproductive women were concerned about family planning. We also posted family planning related posters in 10 villages (52 posters in total);
10. Bean plantation using compost in the two villages as well as the plantation of control parcels (no compost at all) planting were pursued. During the first quarter, because of the insect pest attacks (grasshoppers) the crop failed. Since then, a similar research on the insect attacks prevention deserve to be implemented;
11. Studies of the initial state of the reintroduction site of giant tortoises. It is essential to know the baseline data or to define the initial state (T0) of the environment, particularly in terms of biological and environmental data. A data collection mission was carried out in February to inventory and describe the vegetation in the enclosures site. This mission is also part of the preparation of a Master's thesis in plant ecology of a student (Antananarivo University, Plant Biology and Ecology Mention). The specific objectives were:
- describe the sites chosen for the location of the enclosures;
- describe the ecological landscape of the project;
- study and describe the state T0 of the floristic composition and the physiognomy of the vegetation in the enclosures;
- describe the characteristics of the substrate

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

Impact Description	Impact Summary
Strengthen protected area management by the long term (tortoise grazing, fire-retardant barriers) reduction in the impact of fire.	Strengthening the management of protected areas by reducing the long-term impact of fire is done through the regular maintenance (clearing, ...) of fire breaks we created since 2017, and monitoring- of fuel break plant buffer planted along the cleared firebreak transects.

	There is no result from the tortoise grazing to date as this activity was canceled for the reason explained above.
Human and financial resources can be utilised for other projects at Beanka.	Firstly, the employees (care givers, guards) supposed to involve in the giant turtle reintroduction project are not recruited because of the reasons explained above. The contract term of the assistant working on the CEPF project, despite the usefulness of its assignments, will have expired by the end of December, and there are no longer available resources to ensure the continuity of his position. The payment of the rewards and allowances of the two nurseries financed since 2017 until July 2019 by the CEPF will be relayed to another lessor who has agreed to take charge of them in its envelope. However, there is always a synergy between the staff of BCM, especially the managers and assistants, regardless of the project type to be implemented or the place occupied by the employee. As an example, the production efforts in tree nurseries where 5 nursery attendants have worked with salaries financed by the different donors are oriented simultaneously for the production of all plants we needed throughout the year, but the objectives for each project must always be respected and attained by the deadline.
Reintroduction of tortoises is a landscape-based, long-term, low maintenance approach to manage large areas of degraded land at risk of fire and lessons learned from this project will assist conservation planning elsewhere in Madagascar. Successful reintroduction of giant tortoises is a prerequisite for the establishment of a breeding rescue centre of the Critically Endangered Ploughshare tortoise (angonoka, Astrochelys yniphora). International non-governmental organizations, namely Durrell Wildlife Conservation Trust (DWCT) and The Turtle Conservancy, have proposed that Beanka could be a suitable site where angonoka, confiscated from the illegal pet trade, could be kept in wild conditions. These animals cannot be returned back to Baly Bay due to the risk of disease transmission to the wild population.	The studies conducted by Fleurette in February support the DWCT hypothesis regarding the reliability of Beanka as an effective potential site for combustible biomass control by the turtles. With some nutritional (water points, supply of other nutrients planted in the environment) and logistics supports (guarding, periodic maintenance), turtles could survive and enter the mechanism of permanent mutualism with the ecosystem at Beanka. The impossibility of the reintroduction of these animals because of their prohibition would constitute a barrier for its realization. The high demand for protein by the local communities also implies the need for a guarding and awareness strategy for surrounding villages and people living near Beanka's natural habitats.
Improved rural livelihoods through income from honey production, sale of tamarind fruit and improved food production and security will incentivize forest conservation and reduce the amount of land needed for agriculture.	Actually, only the honey sector has produced results on income generating activities. In spite of the small to moderate volume of honey produced in the breeding hives brought to the communities, the impact of the sale of honey still brings some benefits. Some of them may have had the means to send the children to school, but note that it is not always the financial unavailability that prevents parents from sending the

	children to school. Children in a number of villages help parents cultivate the fields or harvest crops. The sale of honey allows them to advance the breeding of poultry by the improvement of the parents. This sector is not only the first protein resource, before zebu (once in 2 months in general), but also a significant income from some villages by the sale of chickens to restaurants on the RN1 Bis road. In some places in Beanka, honey collected in the forest or wild still dominates the market. There is still a long way for BCM to introduce and develop bee breeding to most forest bee swarm hunting communities. With regard to the production of tamarind fruit, tamarind seedlings transplanted into green firebreaks are still in the vegetative stage. It usually takes 15 - 20 years for young trees to ripen and produce fruit.
Raised awareness about the impact of fire on biodiversity and livelihoods leading to a reduction in fire use as a pastoral management tool.	The sensitization carried out on the impact of fire on biodiversity and livelihoods have been noticed to a considerable reduction of the use of fire as a tool for pastoral land management tool. Our approaches were the use of posters, the production of fire module, awareness meetings and displays environnement documentary films in malagasy language. Only around 2 ha of cleared forest surface converted into rice and corn has been in the far north of Beanka by the middle of 2018.
Increased capacity of staff and local villagers in nursery management, tree propagation, tortoise husbandry and surveying and monitoring techniques will sustain the conservation project and improvements in education and job opportunities will reduce the reliance on natural resource exploitation.	A part from the above explanation, BCM employs permanently 10 forest patrol officers, three nursery attendants based in Beanka and three senior staffs based in Maintirano which ensures the implementation in all the BCM business on the site and in Maintirano, as well as the communication with the staff based in Antananarivo.
Strengthened partnerships with academic institutions and associations, e.g. University of Antananarivo, and Vahatra Association, to conduct evidence-based conservation, develop local communities and train future conservationists.	A partnership between BCM and the research institutions has been established during this project, which related on the project impact on the biodiversity conservation. A student named Maheriniavo F. NALISOA « Université d'Antananarivo Domaine sciences et technologies Mention biologie et écologie végétales ». This student was observing the state of flora and vegetation in the turtle enclosures and the landscape before the reintroduction of giant tortoises in the protected area of Beanka, Melaky Region. The Vahatra association managed the development of the methodology adopted for this research and prepared the mission planning (logistics and financial management). This research is part of a dissertation for a Master's degree she presented on September 04,

	2019.
Reduction in the birth rate and greater time elapsed between children, coupled with raised awareness of the need to protect the forest, will reduce pressure on biodiversity.	Amoung the sensitized women, an overall 162 sexually active women (8 villages) agreed the practice of the family planning. However, within the two years implementation of the project, the impact of this activity, or the greater time elapsed between children on the forest protection won't be measurable in short time. Even though the CEPF funding was end in July 2019, and because of the difficulties for the women to have access on the FP materials (villages far from health care center) BCM will continue the activity and the long term follow up as well as the impact of PF project on the long term conservation of the forest.
Greater civil society awareness of how the state of natural ecosystems are related to food production, security, human health and biodiversity.	In partnership with the technical services DREDD and DRAE Melaky, through the organization BCM, during the 2nd quarter of 2018, a community awareness was given concerning the fight against fire, the social contract "Dina", the promotion of the agriculture, namely composting techniques, market gardening, livestock farming (beekeeping), ...Given the monthly reports obtained from the forest patrol officers mentioning the existence of tree cutting in the NAP Beanka which often caused by honey harvesting by the communities, the situation promoted by BCM with funding from CEPF to promote the modern beekeeping project around Tsingy was testified as excellent by the target communities.The discussion with the communities focused mainly on the reduction of the frequentation of their activities in the NAP and the prohibition of the cleaning of the natural habitats and their conversion in cultivated lands, in return the activities that can be realized for the subsistence of the communities and income generators have been identified to reinforce those already in place. Activities that do not affect the integrity of the NAP. Part of the meeting has always been devoted to the consideration of community grievances that mainly concern poverty, children's access to education and insecurity.

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

Impact Description	**Impact Summary**
Reintroduction of 220 giant tortoises to Beanka PA.	This activity was not conducted and not achieved, because of the persistence of law in Madagascar prohibiting the importation of animals from the islands of Mauritius and Rodrigues which is still in force to the current time.
Propagation and planting of 15,000 native plant species.	Since the beginning of reforestation with native trees of forest gaps and sites cleared in 2017, the total number

	of indigenous young trees planted is about 24,805 or 11,167, 4,284 and 9354 indigenous plant species transplanted during the rainy periods of 2017 and 2018, and before the end of March 2019 respectively. the mortality rate is estimated at 17 to 23% of the plants, an estimate made one to two years after the reforestation sessions. No fire finding was mentioned in all the forest restoration sites (enrichment) considered during the realization of this project. No fire finding was mentioned in all the forest restoration sites (enrichment) considered during the realization of this project. The prolonged annual dry period and low rainfall have a considerable impact on plant development and survival rate of young plants.
Propagation and planting of 13,800 tamarind trees as a fire-retardant barrier, and food for lemurs and local communities.	Since the beginning of the reforestation of the buffer zone in 2017, the total number of tamarind trees planted is about 21920, which represented the efforts during the rainy periods of 2017, 2018 and the first quarter of 2019. However, because of the devastating savanna fire some of the reforestation sites (70%) already with tamarind trees, about 62% were dead or faded but, from our survey one month after the fire, we hope that 35% of the 62% burnt will be recovered and after the rainy periods of 2019, we hope 10% of the 62% were dead completly. As a result, if we subtract the number of dead plants, we estimate that the plants that survive in the fire retardant buffer are 4570 (30% of reforested sites) plus 4868 plants that survive after fire plus 2780 young plants restored in December and 3620 before the end of March 2019, giving a total of 13,758 young plants (with around 72% of survivors) growing along the fire retardant buffer. The tamarind trees transplanted during the first quarter of 2019 are maintained.
Creation of 11.5 km of a forest-grassland fire buffer.	The fire breaks created measured so far 12.8 km. The reason for choosing a status partially achieved is that some parts (60%) of previously created firewalls were filled with vegetation that grew during the rainy season and should be cleaned again as such vegetation during the dry season easily communicates fire. In order to keep the green created firebreak, regardless of the CEPF funding completion it is important to conduct monitoring and follow-up of the fire-breaks.
Closed canopy forest following planting of 6 ha. grassland gaps.	Because of the low growing rate of the planted trees assessing the closing canopy forest is still not possible. The trees are still short and the height of planted trees since 2017 ranges from 45 to 85 cm, the estimate of the evolution of the canopy forest is not yet feasible. The

	reason for choosing the status partially achieved is that, the total area performed is well above the target of 6 ha, while the very slow growth rate of the plants still puzzle on the canopy cover estimation. However, the planted trees since 2017 correspond to a range of 16 to 19 ha of reforested area. The growth rate of young trees depends on the climatic and edaphic conditions. It requires around 30 years for young trees to reach the maturity status, or, subjectively, to estimate the closed canopy area.
Increase in the number (13) of trained staff. Positions to be filled: 4 tortoise watchmen, 3 tortoise care givers, 2 general labourers, 1 project assistant and 1 family planning officer, 2 nursery attendants.	The total number of staff recruited following CEPF funding was 4, a financial officer based in Beanka, two nurseries and an assistant to the regional manager. Due to the lack of funding for the coming years, the assistant will leave BCM at the end of the year (2019), while the cost associated with these three other employees will be allocated to a donor (the FAPBM) who has funded conservation and social projects in Beanka since 2015. The financial manager who did not exist before improves the financial and administrative management of BCM on the site. With the two additional nurseries, the production of plants in nurseries would be increased from the end of this year, allowing us to increase the clearing area to be restored.
Raised awareness among local communities (approx. 80 families from 6 main villages) about the impact of fire and family planning. Strengthen management of 22 fire associations, measured by a reduction in fire frequency and numbers.	With the contribution of the Forest and Environment representatives (Melaky region) and the BCM team, four meetings were held in May and June 2019 in four villages. The document related on social contract (called in Malagasy Dina or social contract: that regulates the land use and collect of forest products) was discussed in each village for a final review by the community members. Taking into account recommendations and / or corrections, the Dina was signed and approved by the community member leaders. Four villages not yet visited by the first mission but on 16 to 22 of june 2019, the missionaries of the Forest and Environment representatives of Melaky region were involved again for the second mission to visit the remaining villages: Mangabe, Ambalabao, Ankiranomena and Mandeharira for the same purpose.. This activity is part of the process of setting up the Dina, a recall of the previous stages before reaching this revision phase was therefore considered relevant for all communities. The technical services also reminded the need and the importance of the dina while explaining that it is an adequate platform, which brings together the same point of view on the governance of the resources use.
Income generated by local people from	Our estimate of the total volume of honey ranged from

the sale of honey.	95 to 135 liters, with a turnover of 570,000 to 810,000 Ariary (154.05 to 218.92 dollars) for the two target villages (Ambinda and Ankilimanarivo), but the products are not always sold, they are also used for domestic consumption. Actually, the honey produced is sold locally, the price of a bottle of one and half liter (1.5 l) is around 6000 ar to 10 000 ar depending on the season? The price of a 20 liter can filled with honey, is between 80,000 ar - 120,000 ar. Given such facts, the honey sector in the community of NAP Beanka begins to be among the important sources of the community.The production of honey in the two villages in the south-west (Andranogidro and Vohimihary, Maperabe) is not yet estimated because the four hives have been installed recently.
Research projects (3) with local and international universities to guide conservation management.	Because of the impossibility to reintroduce the giant turtles to Madagascar, only one research project could be conducted. It was done by one student (Fleurette Nalisoa Maheriniavo) from the Botanic Department of the University of Antananarivo who conducted the preliminary study on the vegetation and edaphic situation of the sites before the arrival of the turtles. Her studies stop on the description of the zero status of the vegetation before the arrival of turtles and which could no longer be continued. However the study subject was relevant and allowed her to finalize her memory on Master's Degree on Plant Biology and Ecology that she defended publicly on September 04, 2019.
Production of compost to improve soil fertility trialed in 3 villages involving 3-6 families.	As previously explained, four families received training on the preparation and production of compost and neighbors also learned from their know-how, the knowledge on handling and the necessary composting materials. The results were satisfactory, while the water of the streams irrigating the alluvial soil brings nutrients to the soil. Most farmers next to Beanka are happy to cultivate the soil without any input such as biological or chemical fertilizer. Their preoccupations focussed on the fight against pests and natural predators (insects, birds, mammals), to which BCM also directs its intervention by setting up socio-environmental projects. BCM's role is thus to make the link between the donors and the communities. BCM explains the concrete cases that live the communities and their need to improve their living conditions by supporting their income generating activities or bringing well-being in order to minimize the disturbance of the forest by the communities.

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

- As explained in the progress report at the end of 2018, the introduction of the first turtles is still not possible until June 2019. While in our calendar, two Rodrigues turtle expeditions to Madagascar were expected in 2018, was not done in 2017. The reason is that, because of foot-and-mouth disease, the law of the Malagasy government prohibiting the introduction of live animals from Mauritius and Rodrigues to Madagascar is still in force and no reasonable informations on the declining of the disease case in the Mauritian territory has emitted.
- With the plantation of 15 000 indigenous trees, objective, the achievement exceeded such number because 24,805 were done.
- The plantation of 13800 tamarinds was largely reached, 21920 tamarind plants were plantes to form the fuel break buffer.
- 12.8 km were completed during the project, while our objective was 11.5 km, indicating that the initial goal has been exceeded by around 11%.
- Training and building the local communities capacity was a success as they understood that actions against fire are the most effective way to protect the environment in rural areas. Beekeeping has also been successful thanks to the close supervision of the contributors and some farmers start to gain benefits through selling the honeyin the local market or the passengers and road hauliers using the RN1 bis.
Long-term: The success of bee breeding is largely due to the fact that people did not engage in the pursuit of the honeybee hunt, but that they practiced the instructions and methods of bees breeding, which led to a general success.
- Prevention of childbirth is one of the most successful project. Most of the large villages (9) have been concerned and up to, 85% of reproductive women were involved on the family planning activity. Such success was partially due to the posters we posted in the 8 villages (48 posters in total). As such project need a long term follow up, from August 2019, BCM will fund the continuation of this project and conduct through the involvement of the community health officer the monitoring and evolution of the concerned families.
- Capacity building was conducted and to improve the ability of the tree nursery attendants, the families practicing poultry farming, bee farming and agriculture.
- In order to maintain or improve the production of reforestation and restoration plants, BCM opts for two strategies, to keep the five nurseries working for the production of the plants and to set up a well with a water-tank within the tree nursery location. However, the salaries of two nurses were at the expense of CEPF, we managed to find a lessor who agreed to cover their salaries and the installation of the water tank powered by a submersible solar pump.

Were there any unexpected impacts (positive or negative)?

In general, short-term efforts beyond the established goals have been achieved such as the production of plants in the tree nursery, family planning, sensitization on fire-fighting actions. Yet, we have noted that the slow growth rate of plants whether on restoration sites or firebreaks. This slow growth of the plants coupled with the long drought time makes it difficult to estimate the long-term survival of these plants. This finding would have an impact on the canopy area estimate covered by planted plants.

Because of the almost dry climate at Beanka and the lack of knowledge about melioriferous plants and their reproduction phenology, the manual adoption of the hive at the beginning of the project has failed (about 50%) and subsequently, the installation of swarms in the hive should be done with caution and at the right time. The existence of termites progressively attacking the wood of the hive was also another challenge we faced. These issues had an impact on the volume of honey production from the beginning of the project. The impossibility of reintroducing giant tortoises would have an unexpected impact on the long-term fire management that is explained in the grant agreement.

Project Components and Products/Deliverables

Describe the results from each product/deliverable:

Component		Deliverable		
#	Description	#	Description	Results for Deliverable
1	Reintroduction of 220 sub-adult giant tortoises	1.1	220 sub-adult giant tortoises at Beanka PA: 20 in year 1, up to 100 in year 2, up to 100 in year 3 depending on results of pilot study.	Not started and not achieved, because of the persistence of law in Madagascar prohibiting the importation of animals from the islands of Mauritius and Rodrigues, which is still in force until present.
1	Reintroduction of 220 sub-adult giant tortoises	1.2	Scientific committee with annual minutes of meeting.	Meeting in La Réunion during the Island Biology Conference (2019). It was agreed with the idea of extending the project by about 2 years, taking into account active or passive fire fighting activities. While waiting for the levitation of the law prohibiting the reintroduction of the giant turtles, and face to the devastating fire occurring in the south and south-est of Beanka in 2018, this option could be reinforced with other alternatives such as strengthening the installation of firebreaks and the protection of young fire retardant tree buffer against drought and fire.
1	Reintroduction of 220 sub-adult giant tortoises	1.3	Project assistant in position with employment contract.	From March 2017 to October 2017, it was Herson Andrianirina who as appointed as the project assistant, his specialization is the plant ecology and graduated from the Plant Ecology, University of Antananarivo. From November, 2017 - present, Andriakantoniaina J. Randrianantoandro (Graduated from the Geology Department, University of Antananarivo) has been appointed as project assistant. However, his contract will expire at the end of the year even though the project end was in July 2019.
1	Reintroduction of 220 sub-adult giant tortoises	1.4	Trained 5 husbandry staff and 4 guards. Pre-activity training assessment completed per	5 husbandry staff and 4 guards were not appointed as the importation of the turtles to Madagascar was not happen.

			person. Signed training forms completed for required competencies. Evaluation and review of staff skills after 6 months.	
1	Reintroduction of 220 sub-adult giant tortoises	1.5	Annual scientific report of tortoise impacts.	The Vahatra team was in the field during February, sampling the flora in the turtles enclosures and control sites. They have done the report regarding characteristics of soil and flora. This study therefore concerned the zero state of vegetation and the edaphic condition before the introduction of turtles. The report was submitted to BCM and attached in this portal.
1	Reintroduction of 220 sub-adult giant tortoises	1.6	2 DEA and 1 DESS university theses.	In February 2019, one student (Fleurette Nalisoa Maheriniavo) from the Botanic Department of the University of Antananarivo has conducted her preliminary study on the vegetation and edaphic situation of the sites before the arrival of the turtles. Her studies stop on the description of the zero status of the vegetation before the arrival of turtles and could no longer be continued. However the study subject was relevant and allowed her to finalize hes memory on Master's Degree on Plant Biology and Ecology that she defended publicly on September 04, 2019 and that is the only study conducted during this project period.
2	Fire-management and awareness programme	2.1	Strengthen local fire management association in operation in 22 villages. Assessment of fire awareness levels pre-and post-activities.	During the first semester 2019, the representatives from the Environment and Forest (Melaky Region) with the BCM team visited the 8 larges villages around Beanka conducting sensitisation activites on fire fighting procedures and long term management of the Natural Resources. Copies of document tool with 17 pages and written in Malagasy were distributed to the 8 local association created in 2018. The tool contains information about the origin of fire, the active and passive action that could be undertaken in the case of fire, with some questions about fire to be answered by the community members as well as some informations about the socio-economic and environmental projects BCM and its partners has conducted in Beanka. The next step will consist of the regularization of these 8 associations within the Districts and Communes so that they become operational. In general, there are 8 main

				villages where BCM operates around the Beanka New Protected Area. Since 2016 three villages were abandoned permanently following the attacks of the "dahalo" stealing the zebu and sometimes killing the village elders.
2	Fire-management and awareness programme	2.2	Guidelines for fire management practice.	From 23 to 30 May 2019, team (Mr James and Mr. Florian) from the Regional Direction of Environment and Forests (Melaky Region) accompanied by six representatives of the BCM conducted an awareness mission on five major villages (Belitsaky, Ambinda, Maperabe , Ankilimanarivo and Vohimihary) in Beanka. The same as the awareness activity released in the fourth quarter of the previous year, the awareness-raising focused more on fire laws and penalties, bushfire control and forest clearing. It was also an opportunity to remind communities of the regulations regarding the cleaning of fire-fueled fields, the hunting or collection of protected / endangered animals, the banning of quarry products and quarrying, its derivatives and the right of use for the community. Right after such mission in May 23 to 30, 2019, with the same purpose as above, a second mission was made on June 16 to 22, 2019 in the village Mandeharira the far northest part of Beanka.
2	Fire-management and awareness programme	2.3	Posters distributed on impacts of fire.	A part form the 50 posters distributed around the 8 villages in Beanka, 48 more posters (A2 format, 4 types and12 copies for each) were posted by the first half of 2018. They drawn and printed in Antananarivo with relevant images and messages on bushfire disasters. They were stuck in the areas more frequented by villagers and passengers / visitors. All printed posters have been posted at the various locations listed below and the four sample posters will be uploaded in the portal. The locations where the posters were posted are: - the Belitsaky market; - Belitsaky Hotel & Restaurant; - Ambinda Primary Public School; - at the FIFITSI counter in Maintirano; - At KOFIMANDIDY counter in Maintirano; - the DREEF Melaky office; - And especially in the 8 large and small villages around the protected area.
2	Fire-management and awareness programme	2.4	Annual report on fire outbreaks and maps of high-, medium- and low- risk fire areas.	For this year, the fire season is not yet finished, we are collecting information on the fire occurrence and towards the end of November, at the beginning of the rainy season, we will analyzes fire cases in the Beanka territories and report on the comparative investigation between consecutive years. The maps of high-, medium- and low- risk fire areas last year files are attached in this

				portal.
3	Fuel breaks and fire-retardant tree buffer of 11.5 km along the dry forest edge	3.1	11.5 km fire-retardant tree buffer created.	For two weeks in March 2019, 14 forest patrol officers and tree nursery attendants carried out the transplantion of 3620 tamarind along the fire break. The reforestation land is located in Sarodrano along the southern part of the green firebreak already transplanted with tamarind trees during the last quarter of 2018. We decided to mobilize the BCM officers for reforestation to ensure that the correct planting techniques were respected but also during such reforestation period, the community members were busy in their farmland and the associated routines. The work consisted of connecting the firewall already made and that of Mangatoka while respecting the distance between the transplanted seedlings. As we realized last year, the distance between tamarinds, the single species considered during this activity, was 2.5 meters. The 3620 tamarind plants aligned in the firebreak represented 3012 m of retardant tree buffer created in March 2019.
3	Fuel breaks and fire-retardant tree buffer of 11.5 km along the dry forest edge	3.2	Production of 15, 870 fire-retardant trees. Assume around 15% mortality in nursery.	There was no preparation of tamarind plantlets production during the first semester 2019 because the tree nursery attendants start the activity by sowing the seeds by the end of July and it takes around 4 to 6 month to develop the pants in the tree nursery before the transplantation in the reforestation site. However, among the 4498 tamarind seedlings developed at the tree nursery in Ambinda by the end of January 2019, 3620 of them were planted in March and the remaining 878 left in the nursery would be used to replace the dead tamarinds in the reforested sites.
3	Fuel breaks and fire-retardant tree buffer of 11.5 km along the dry forest edge	3.3	4 trained nursery staff, 20 persons employed part-time to create the fuel breaks, plant and maintain planted saplings.	The five nursery staffs have worked on the preparation of some 9900 tamarind seedlings a year to be planted in the fire buffer zones between the savannah and the dry forest in the south and southeast of Beanka (tamarind seedlings). Regarding the salary burden of these employees, the salaries of two people are taken from CEPF funding but only until july 2019, one from Biodiversity Madagascar Funds and for the last two people from BCM's own funding.
3	Fuel breaks and fire-retardant tree buffer of 11.5 km along the dry forest	3.4	Annual report on nursery production, planting, weeding	Report completed and put in place with the same file as the reforestation report. The map showing the reforestation sites is attached with this portal.

	edge		activities and plant survivorship. Map of boundary planted.	
4	Reforest 6 ha. of grassland gaps	4.1	Production of 17,250 native seedlings. Assume around 15% mortality in nursery.	The five nurseries have a production quota to reach 17250 encompassing the overall plant species which would be transplanted in the reforestation sites (fire break buffer zones, forest gap, degraded forests, savanna). So far, 24 805 of native seedling is produced in the tree nursery. In June, the survival rate of plants in nurseries was studied. In some circumstances, the plant diseases in the tree nursery still persisted despite the use of insecticide spraying. A low mortality rate of indigenous plants in plastic sheaths was found ranging from about 3 to 7%.
4	Reforest 6 ha. of grassland gaps	4.2	Planting of 6 ha of grassland gaps.	With respect to the reforestation of native species, we planted 9 354 in the first quarter of 2019 (March). The 14 BCM field officers and the inhabitants of Ambinda achieved the reforestation in Tsarasahabe. Tsarasahabe is a forest gap located in the heart of the Tsingy Forest between 18 ° 03'14 '' and 18 ° 03'40.32 South Latitude and 44 ° 30'50.40 '' and 44 ° 31'16.30 '' East Longitude. It is among the savanna inside the forest, which was burnt last year, that's the reason we have restored this gap. These 9 354 plants comprising 4 indigenous species (Rotsy, Sohihy, Mangarahara and Soalafika) cover 4 ha of area and represent about 10% of the reforestation field in Tsarasahabe. As a result, the planted trees since 2017 correspond to a range of 16 to 19 ha of reforested area.
4	Reforest 6 ha. of grassland gaps	4.3	4 trained nursery staff. 20 persons employed to plant and maintain planted saplings.	The five nursery staff have worked on the preparation of some 9900 indigenous (native) seedlings a year to be planted in the degraded or forest gap located in the south and southwest of Beanka. Regarding the salary burden of these employees, two are in charge of CEPF funding, one to the Biodiversity Madagascar Funds and the other two to BCM's own funding. By the end of January, 9189 have been produced by these five tree nursery attendants, which will be planted afterward. The community members (20 to 40 people depending on the size of the area to be reforested) are involved and paid 300 Ariary per plant during the reforestation sessions.
4	Reforest 6 ha. of grassland gaps	4.4	Annual report on nursery	Report completed and put in place with the same file as the reforestation report. The map showing the

			production, planting, weeding activities and plant survivorship. Map of planted sites.	reforestation sites is attached with this portal.
5	Honey production	5.1	Two villagers trained in hive maintenance, bee keeping and honey production for 3 months.	At the moment 38 hives are active but 10% are to be filled and 90% are productive, the 10% of them were used to fill empty hives and 90% (33 hives) others have produced honey that the community sold or collected for domestic consumption. The honey production of the 33 active hives was evaluated in 2019. Our estimate of the total volume of honey from their sales increased from 100 to 128 liters, earning from 600 000 to 768 000 Ariary (USD 176 to 226, exchange rate: Ariary 3,400), the turnover of the three target villages (Ambinda, Andranogidro and Ankilimanarivo), but the products are not always devoted for sold, they are also used for domestic consumption. The owner of the hive can collect honey 3-4 times a year.
5	Honey production	5.2	Honey produced and sold to Sigma agrobio/T'telo as indicated by agreement with partner.	The explanation of this part is the same as last year. Sigma Agrobio / T'telo has not yet been involved. They (especially their customers) would prefer monofloral honey and would be interested if beekeepers could produce enough honey that they periodically need. Firstly, honey produced by hives in our project site comes from many varieties of forest flowers. The tamarind that we planted would take 10 to 20 years to produce flowers that will provide the bees nectar and pollen from only tamarinds. Secondly, the products are not yet sufficient to satisfy the market and most hives are home to growing swarms. The moderate quantity of honeys collected is intended for local businesses (sold to Maintirano or sent to far towns) and for domestic consumption.
6	Family planning	6.1	Participant lists for family planning sessions organized in 22 communities.	During the first and second trimesters 2019, women of reproductive age in some villages in the BCM intervention areas received family planning treatment and regular monitoring and awareness. Thanks to the collaboration with the community agent (CA) of the NGO Mahefa, we were able to carry out this activity. The community agent named Marie Ange, knows the villages well and could move in remote and inaccessible areas in four or two-wheel drive. Seven villages (Ankiranomena, Ambinda,

				Ambalabao, Maperabe, Mandeharira, and Andranogidro) benefited from this activity. The village of Ankiranomena has the highest rate of female practitioners. The most popular contraceptive method approved by women is depo injection. An injection of 3 ml of suspension, ie 150 mg of medroxyprogesterone acetate, allows a 12-week contraceptive coverage. In total, 162 women in active reproduction are participating in this program which, by extrapolation (we assume 5 children per household), corresponds to 50% the number of sexually mature and active mothers and young women in a population of 475 to 500 inhabitants.
6	Family planning	6.2	Family planning posters distributed.	52 family planning posters were distributed during the second quarter of 2019. They were posed by BCM's forest patrol officers in 8 villages and on the corners of the RN1 Bis road frequented by residents living near Beanka.
6	Family planning	6.3	Family planning module produced.	Family planning module produced in 2018 and still used before the end of 2019. We also used a Malagasy leaflets produced by the PSI Madagascar entitled “Fandrindram-piainam-pianakaviana, ataovy ny safidinao”.
7	Managing sub-grants and monitoring project	7.1	Memorandum of Understanding between Biodiversity Conservation Madagascar and Association Vahatra, PBZT and local villages.	The Memorandum of Understanding between Biodiversity Conservation Madagascar (BCM) and the Vahatra Association was signed on November 16, 2018. However, collaborations with the Tsimbazaza Botanical and Zoological Park as well as with the riparian communities were not achieved w and canceled because of the impossibility of implementing the giant turtle reintroduction project.
7	Managing sub-grants and monitoring project	7.2	Biannual reports from sub grantees, received and approved by BCM	The detailed preliminary study report on vegetation inside the turtle fences and on the chemical composition of the soil was made and sent to BCM. Two representatives of the Vahatra association who contributed to this research. According to the study conducted by Fleurette Nalisoa Maheriniavo concerning the T0 condition study of flora and vegetation in enclosures and the landscape before the reintroduction of giant tortoises into the Beanka protected, the soil is weekly acidic or even neutral with a loam-clay texture. Its high content of physicochemical properties such as the C/N ratio, the exchangeable bases and the cation exchange capacity gives it a fertile soil favorable for the

				development of many species.
7	Managing sub-grants and monitoring project	7.3	Theses (3) of research conducted at Beanka.	As explained above, only one thesis conducted by Fleurette Nalisoa Maheriniavo on the status of the vegetation before the turtle's settlement, the two other studies could not be conducted and canceled due to the impossibility of the reintroduction of giant turtles.
7	Managing sub-grants and monitoring project	7.4	Annual prize distribution to best village association in fire management. Publicity in local press (newspaper, radio) and BCM website.	The prizes were offered at the end of each year (2017 and 2018) to the best communities that demonstrated great competence in fire management in their respective villages and territories. BCM's fire management program was launched on the radio during World Environment Day (June) as well as the better communities that live in territories where there were fewer fires occurrence last year.
7	Managing sub-grants and monitoring project	7.5	Annual prize distribution to best village farmer association. Publicity in local press (newspaper, radio) and BCM website.	The prizes were offered at the end of each year to the best communities that demonstrated great competence in farming activity () in their respective villages and habitats.. However, BCM's improved farming and agricultural program was launched on the radio during World Environment Day as well as the best farming communities adopting the improved farming practice and the agricultural yields were satisfying.
7	Managing sub-grants and monitoring project	7.6	Strengthened organizational capacity of Biodiversity Conservation Madagascar, as evidenced by comparison of civil society tracking tool (CSTT) at project start and end	At the beginning of the project, the civil society monitoring tool was submitted. With the contribution of the BCM, scientific coordinator, the assistant based in Antananarivo and the staff in Moramanga, we reviewed the tool again in October it and is submitted in the portal. An increase of 2 points of the score was noticed.
7	Managing sub-grants and monitoring project	7.7	Improved management of the New Protected Area as	In October 2019, a revision of the Management Effectiveness Tracking Tool was done by project assistant in Maintirano, the BCM scientific coordinator and his assistant based in Antananarivo at the end of the project in July 2019. A total score of 67 points was recorded at

			evidenced by comparison of the Management Effectiveness Tracking Tool (METT) at project start and end	the end of the revision and is submitted in the portal.
7	Managing sub-grants and monitoring project	7.8	Annual report on Environmental safeguard produced	It will be an update of the document (French version) that we have created. The management tool distributed to the communities includes questionnaires to be answered by the 8 associations. Their answers are useful to us because it would make it possible to update the information to be put on the environmental safeguard project in Beanka. The questionnaire describes the findings of the communities concerning environmental problems in their territories and the difficulties they face in controlling environmental damage despite their desire to act against threats.
8	Improved food production	8.1	Composting methods experimented.	The use of compost is useful, the households that contributed to the production and use of compost are convinced of the interest that to their agriculture products. However, the major problems facing farmers are elsewhere, locust control and thieves (humans, grain-eating birds and bush pigs) and destructive (eroding zebus) agricultural products on the fields. About details of the experiment on composting,two villages were chosen for this activity, including Ankiranomena and Ambinda. For Ankiranomena, In november 7th, 2018, a meeting with Mr. TSIALOFA, peasant owner of compost and field of culture in Ankiranomena, allowed the launch of the activity. A composter measuring 3 m3 of which 2m long, 1.5m wide and 1m deep was filled. The composting technique is slow in general and depends on humidity, heat and also the turning of the compost. The raw materials used for composting are tree branch, hay, banana trunk , manure (dung), fine sand and water. For Ambinda, on November 26, 2018, a new compost was launched. The BCM nurseryman called NASY is more advanced in composting knowledge, so he knows the raw materials that decompose faster. The compost pit is of the same size as that of Ankiranomena. The materials they used were the same as above.
8	Improved food	8.2	Evaluation and	Harvests resulting from the use of compost in 2017 and

	production		report on composting methods.	2018 showed a return rate of 20 to 35% of agricultural products. Composts made late in the fourth quarter (2018) were used to strengthen the results of the same activity in 2019. Farmers responsible for the development of compost have since followed the placement of piles of debris from composting plants to the stage of compost maturity or they are ready to use. They watered the compost once or twice a week depending on weather conditions. As of January 2019, compost was used for planting beans (two varieties). The planting plots using compost alternating with other control plots without compost were established. These parcels during the development of the plant were monitored and maintained, weeds and parasites were eliminated. The harvest results between plots were measured to understand and demonstrate to communities the importance of compost for agriculture. Concerning compost's production, the composting test was a success, because by referring to other documentation on the subject and following the decomposition process, after two months, at the harvest, a loss of 2 / 3 of the materials was found.

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

For a long term conservation of the natural ressource and for the profitability of income-generating activities, a handbook on firefighting strategies has been launched and disseminated to the 8 local association to encourage people living around the area to be responsible especially in case of fire.
We also used satellite imagery to detect flames through ''modaps firms''.
Also included is the use of the SMART logic to monitor the operation of the forest police around the protected area. All of this was done to achieve the goal of providing fire occurrence information for immediate action,.
An 8-page tool on family planning prepared by the PSI project was printed and multiplied to facilitate the awareness of the families to adopt the practice of birth control. Since the majority of the population can not read, plenary sessions explaining this activity were the main commitment of the health officer involved in this activity.

Lessons Learned

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:

- Project Design Process *(aspects of the project design that contributed to its success/shortcomings)*
- Project Implementation *(aspects of the project execution that contributed to its success/shortcomings)*
- Describe any other lessons learned relevant to the conservation community

- The establishment of structures and mechanisms for the reinforcement of the forest managment through a recognition of pre-existing social relations and community regulations (power) ;
- Capacity building but it requires continuous followup by the manager and the local authorities ;
- Enhancement of the natural resources for the benefit of communities without impacting the long-term conservation of natural habitats and the promotion of ecological restoration and agroecology;
- Sensitization of the population on the importance of biodiversity;
- Making and strengthening firebreaks before the period of proliferation of fire (before the month of May)
- Anticipation of reforestation (month of December instead of January, February) to be conducted before the rain period;

Sustainability / Replication

Summarize the success or challenges in ensuring the project will be sustained or replicated, including any unplanned activities that are likely to result in increased sustainability or replicability.

- Reduce the communitie visits in the forest: Empower the local population and improve their livelihood;
- Responsible and autonomous inhabitants: Capacity building of inhabitants through various training and sensitization : know-how;
- Use of other fire-resistant, fast-growing species: tamarind trees or much faster growing trees;
- Extension of firebreaks: eastern part of the NAP;
- Employs more sophisticated materials to monitor fire in real-time (to avoid the devastating situation in 2018) and anticipate firefighting: Drone;
- Establishment of guard posts and fire monitoring points in areas more exposed to fire;
- Provision of active control materials to communities and BCM forest patrol officers: fire fighting materials, water sprayer bags;
- Continue using CEPF funds for 2 years and/or research others funding sources.

Safeguards

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

Additional Comments/Recommendations

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

- Support long-term measures for the sustainability of activities already implemented by the CEPF-funded project;
- Transfer management of certain inaccessible forest fragments (maintenance, monitoring, and controls of created green fuelbreak and firebreak, etc.) to communities via associations;
- Before initiating conservation work, consider long-term means and techniques for the continuition of the activity;
-In future investments: carry out projects related to the concepts for sustainable development.

Additional Funding

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

Total additional funding (US$)
$114,937.33

Type of funding
Please provide a breakdown of additional funding (counterpart funding and in-kind) by source, categorizing each contribution into one of the following categories:

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 investm*ent or successes related to this project)

A Project Co-financing: YES
1. **Bioculture (MAuritius) Ltd. (2017-2019): 81323.41**
2. **Fond pour les Aires Protégées et la Biodiversité de Madagascar (2017-2019): 33613.92**

B Grantee and Partner Leveraging: NO
C Regional/Portfolio Leveraging: NO

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, and publicized in our newsletter and other communications.

1. Please include your full contact details (Name, Organization, Mailing address, Telephone number, E-mail address) below

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