



# Support to Project for the sustainable use of Non-Timber Forest Products in and around Gilé National Reserve, Mozambique

## Mid-term report

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**nitidæ**  
landscapes & value chains



## Resumo executivo

Desde 2007, a Fondation François Sommer/*International Foundation for Wildlife Management* (FFS-IGF) está a gerir a Reserva Nacional do Gilé em parceria com a Administração Nacional das Áreas de Conservação (ANAC), com o objetivo de conservar a biodiversidade faunística e florística, assim como acompanhar as comunidades circunvizinhas para prosperar dentro da nova conjuntura de conservação da zona. Neste contexto, o Departamento de Desenvolvimento Comunitário (CDD) da Reserva está a liderar um projeto ambicioso para o desenvolvimento de cadeias de valor de diversos produtos florestais não lenhosos (*Non-Timber Forestry Products*, NTFPs) com potencial promissor para promover atividades de renda para as comunidades da zona tampão.

Um desses produtos é o mel, pois é tradicionalmente colhido e apreciado pelas comunidades da zona tampão da reserva e apresenta um valor comercial tanto no mercado local como provincial. Além disso, a apicultura é uma atividade rentável que consegue manter interligados os aspectos sociais, económicos e ambientais e constitui uma oportunidade para promover o desenvolvimento social equilibrado das comunidades.

No início do projeto NTFPs, o CDD concebeu a estratégia de desenvolvimento para a cadeia de valor do mel na zona tampão da Reserva.

Os apicultores estão sendo organizados em pequenos grupos para facilitar o acompanhamento técnico na aplicação de técnicas apropriadas de manejo, assim como estimular a parceria e a associação entre os beneficiários.

No processo de implementação desta estratégia, diferentes questões surgem e precisam de serem resolvidas por fim de definir uma estratégia definitiva para um desenvolvimento sustentável da cadeia de valor adaptado ao contexto.

Através desta consultoria, a Nitidæ ambiciona apoiar o projeto NTFPs com a melhoria dos conhecimentos e a transferência de capacidades a longo prazo para a equipe da RNG, no âmbito dos esforços de monitoria e de desenvolvimento das técnicas de produção e transformação sustentáveis.

Como primeiro passo, algumas formações e missões de terreno foram realizadas por especialistas e profissionais da apicultura nas matérias de produção e cadeia de valor do mel.

No decorrer de 4 dias, a Nitidæ em parceria com a empresa Agrimel realizou visitas técnicas para a monitoria dos apiários e a realização de algumas colheitas de mel nas comunidades localizadas na zona tampão da RNG.

Durante 5 dias, a Nitidæ em parceria com a empresa Agrimel realizou o treinamento dos técnicos e beneficiários em "*Técnicas melhoradas em Apicultura para o aumento da produtividade de mel*" no acampamento de Musseia e trabalhou na zona tampão da RNG com os membros do CDD e conjuntamente com vários grupos de apicultores, para observar os apiários e inspecionar algumas colméias.

O relatório das atividades realizadas é apresentado neste documento, assim como os resultados e as reflexões que surgiram durante a missão.



A fim de continuar a reflexão sobre esses temas, a assistência técnica será fornecida a distância, também com respeito da eleição da embalagem; em relação com as conclusões do estudo de mercado em curso. Tal e qual acordado com a equipe, os seguintes documentos serão elaborados:

1. Uma nota com comentários sobre a estratégia de desenvolvimento da cadeia de valor mel.
2. Um relatório final sobre estratégias de modelo de negócio na comercialização do mel da Reserva.

Como recomendação geral para um trabalho de médio a longo prazo, indica-se a oportunidade de ligar a sustentabilidade da cadeia de valor do mel à sustentabilidade meio-ambiental, através da introdução de sistemas agroflorestais próximos aos apiários para promover a especificidade e a produtividade do mel de florestas de Miombo (*Brachystegias*), envolvendo a produção integrada entre as abelhas melíferas e a promoção da preservação das florestas na zona tampão da Reserva.



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## Glossary of terms

AFD: *Agence Française de Développement* (French Development Agency)

ANAC: *Administração Nacional de Areas de Conservação* (National Administration of Conservation Areas)

BZ: Buffer zones

CDD: Community Development Department

CGRN: *Comité de Gestão de Recursos Naturais* (Natural Resources Management Committee)

FAO: Food and Agriculture Organization

GNR: Gilé National Reserve

FFS-IGF: *Fondation François Sommer/Fondation Internationale pour la Gestion de la Faune*

KTB: Kenyan Top Bar Bar (Bee hive)

NTFPs: Non-Timber Forestry Products

ODK: Open Data Kit

RH: Relative humidity

WHO: World Health Organization



## 1\_Context

### 1.1. The Gilé National Reserve

The Gilé National Reserve (GNR) is located in the Gilé and Pebane districts, in the Zambézia province, in central Mozambique (Figure 1). The reserve was created in 1932, initially as game reserve and have turned into a conservation area since 2000. The core area covers an area of 283 600 ha and the buffer zone 152 800 ha. Climate is composed of a dry season from May to October and a humid one from November to April with mean annual rainfall between 800 and 1,000 mm. Temperatures vary from 13°C (minimum in June in average) and 37°C (maximum in October in average). Forest of the Reserve and its surroundings is Miombo dry forest, typical of this region, with presence of patches of clearings (called dambo) where hydromorphic soils are present. Miombo is characterised by species from the genus *Brachystegia*, *Julbernardia* and *Isoberlinia* (Campbell 1996).

Since 2009, the International Foundation for Wildlife Management (IGF) has been co-managing the GNR with ANAC (*Administração Nacional das Areas de Conservação*) with the aim of conserving plant and animal biodiversity, and is working to rehabilitate the reserve by restoring its infrastructure, combating poaching and reintroducing animals (buffalo, wildebeest, zebra, etc.).

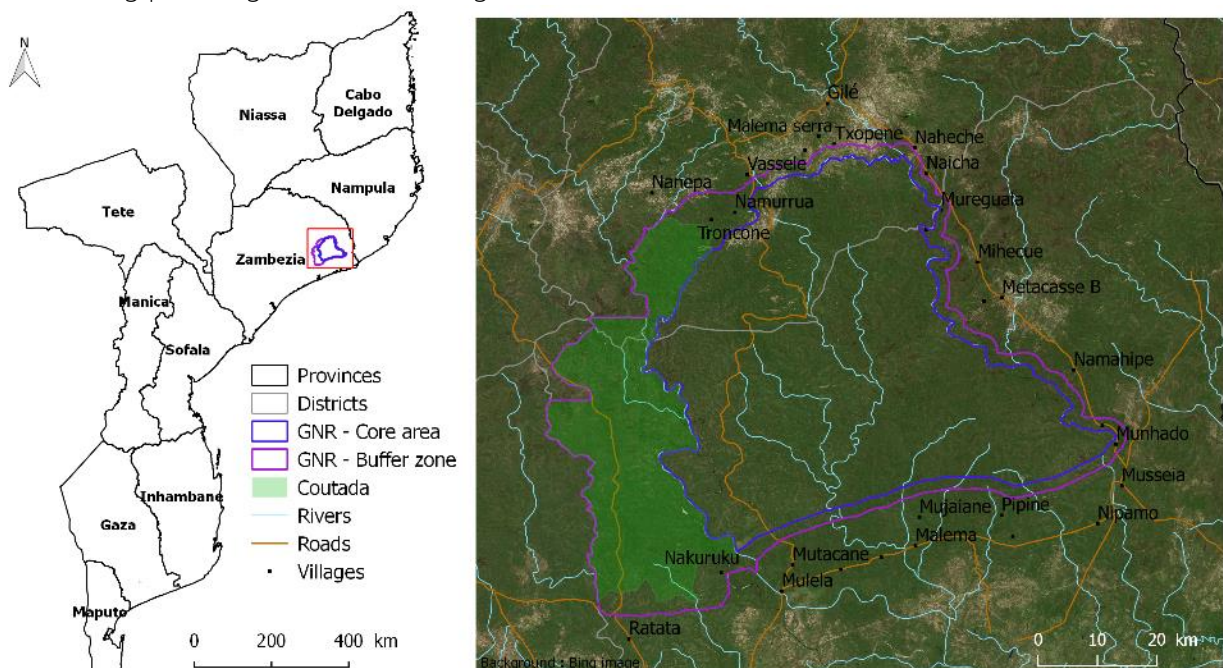


Figure 1 : Gilé National Reserve location

### 1.2. The NTFPs project

The project for the valorization and marketing of Non-Timber Forestry Products (NTFPs), coordinated by IGF started in 2017. This project was set up with the financial support of the French Development Agency (AFD) for a period of 36 months. The project aims to i) strengthen the GNR team capacities to protect natural resources, ii) promote the legalization and organization of the NTFPs sustainable use by local communities living in the Buffer zone, and iii) develop the NTFPs production by identifying and implementing methods, tools and channels of use and valorization.

Nitidæ has been working at the GNR in partnership with FFS-IGF since 2013, with the implementation of several projects: GNR REDD+ pilot project (2014-2017), MOZBIO project (2016-2019), ACAMOZ



project (2018-2021). Through this consultancy, Nitidæ aims to support the NTFPs project by evaluating the potentiality of storing and commercialisation of NTFPs, namely wild mushrooms and honey by local communities living in the Buffer Zone of GNR and providing basic training to selected communities' members and technicians from GNR. The consultancy will capitalize on the work already done by the Community Development Department (CDD) to ensure that the service provides the needed elements to the GNR to move forward. The service will, on one hand: prioritize support to improve and transfer capacity on long term to the GNR team on NTFPs monitoring and sustainable production techniques; and on the other hand: realize pilot tests and market studies to help identify suitable technologies and prioritize the best options for NTFPs value chain development.

This mid-term report presents both the results and comments from the fieldwork carried out from 30<sup>th</sup> November to 03<sup>th</sup> of December 2019 and from the training carried out from 27<sup>th</sup> February to 02<sup>th</sup> December 2020, also the field monitoring and remote technical assistance since the beginning of the consultancy.

## **2\_Technical Assistance in the Fieldwork, Training and Remote Technical Assistance**

### **2.1. Technical Assistance in the Fieldwork**



*Figure 2 : Honey Field Monitoring at Namahipe*





### 2.1.1 Objectives

The objectives of the fieldwork were:

- To enable a first experience of harvesting honey with the key references' beneficiaries;
- To create the first linkage with a private stakeholder;
- To build a vision on the beekeepers about incomes, partnership, investment (build their own bait-hives);
- To observe the apiaries and provide technical recommendations for monitoring and evaluation;

### 2.1.2 Schedule

The Honey fieldwork schedule is detailed as following:

<b>Dates</b>	<b>Juliano Möller Rodrigues</b>	<b>Heinrich Van Der &amp; Fernando Carvalho</b>
29/Nov.	Gurué - Gilé	
30/Nov.	Gilé: 1st meeting, organization with technicians GNR	
	Meeting of selected Beekeeper: Sr. João Muanacurucha - Vassele	
	Field visit to harvest Honey	
	Inspections and recommendation's	
1/Dez.	Meeting of selected Beekeeper: Sr. Julio Sabonete - Namahipe	
	Field visit to harvest Honey	
	(break)	
	Observation of the apiarie-school: locations of the new beehives - – Musseia Camp	
2/Dez.	Inspections of the beehives and recommendation's	
	Meeting of selected Beekeeper: Sr. Julio Sabonete - Namahipe	
	Field visit to harvest Honey	
	(break)	
	Meeting of selected Beekeepers: Lucas, Felizardo - Mihecue	
03/Dez.	Field visit to harvest Honey	
	Meeting of selected Beekeepers: Sr. Anselmo	Way back – Musseia – Gurue
	Honey Field Monitoring-	
Debrief meeting: Outcomes + way forward		
04/Dez.	Way back – Musseia - Quelimane	

### 2.1.3 Location

During the field trip, activities were mainly organized in 5 communities located in the northern part of the Reserve (Figure 1): Vassele, Namahipe, Namurrua, Mulela and Mihecue.

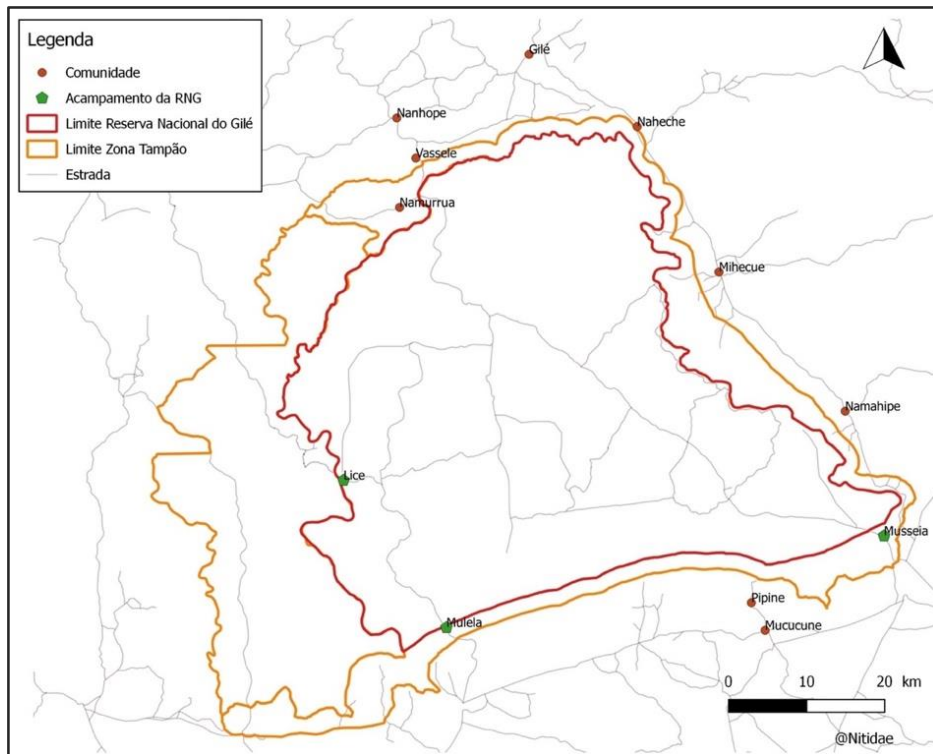


Figure 3 : Location of field trip activities

### 2.1.4 Description of activities

The main goal of this fieldwork was to harvest honey from three key beneficiaries selected by the CDD team to build a linkage with one stakeholder and the beneficiaries, creating successful examples for the others beekeepers.

The field work was held from November 30<sup>th</sup> to December 3<sup>rd</sup>. The forecast for the first day of the fieldwork was to harvest 24 kilograms of honey from 2 beehives of Mr. Joao Muanacurucha from Vassele region, but the prevision was not realistic. The beehives selected were not in the ideal moment for the harvest mainly because of the lack of technical monitoring. Around the area there was a lack of forest and biodiversity and it was possible to notice that there was a lack of technical support to the beneficiary to correctly orient him for the maintenance of the beehive. The structure of the beehive was not in an adequate position and the team had to correct the position of the beeswax lines to enable the production.



Figure 4 : Correction of the beeswax lines to allow the construction of the honeycomb at the right position.



For the second day it was planned to harvest 24 kilograms from Mr Julio Sabonete beehives in Namahipe but because of the heavy rain the team was unable to harvest. Instead was realized the inspection of 6 beehives from Musseia Camp. The beehives were not adequately located as too close to the households and the roads, therefore it was recommended to remove the beehives close to the apiary-school.



*Figure 5 : Beehives located in an inappropriate location.*

The third day of the fieldwork was in Namahipe and it was possible to harvest 9 kilograms of honey from Mr Julio Sabonete Beehives'. The apiary was full of pests and diseases and only one beehive was ready for the harvest. The 2 beehives were infested with hive beetles and wax moths and located in a too much bushy and shady area, it was there too noted the lack of technical assistance and monitoring of the beneficiary.

Although the harvest was far from what was expected, the beneficiary was happy to be able to sell his first production (9kg) for a total of 450 meticais paid by Agrimel, the stakeholder.

Agrimel is a private company located in Gurue district of Zambezia Province, that aims to train beekeepers and beekeeping technicians, in addition to promoting the production and the purchase of the honey.



Figure 6 : The Beneficiary Mr. Julio Sabonete receiving his payment from the Agrimel

The same day, the harvest was done in Mihecue at Luca's and Felisberto apiaries. The access to the area was challenging, with 2 hours and half walk. It was possible to harvest 12 kilograms of honey and the community were able to taste the honey. It is a successful case of beehive location at the buffer zone, close to the miombo forest. Despite the difficult access the beekeepers have the right idea, having approached the local authorities explaining that they need the forest to sustain the bees and requesting the collaboration of the local community in not cutting down trees, setting traps around or starting uncontrolled fires in the area.



Figure 7: Beneficiaries after harvesting honey, transporting buckets for weighing and selling the honey.

The last day of the fieldwork was at Anselmo's apiary, 4 beehives were inspected. It was noticed that the beehives were too much exposed to the uncontrolled fires and there was a lack of vegetation around to feed the bees. Although the location was not ideal, the apiary was very well organized in terms of distribution of beehives and the technician delivered a structured support for the beneficiary



with a very complete spreadsheet of monitoring. When the technician and Anselmo identified the lack of food for bees due to location as the main problem, they planned to move the apiary to a better area.



*Figure 8 : Honey Field monitoring at Anselmo's Apiary*

In summary several weaknesses have been identified in the existing support to the beneficiaries, some of which were a result of the way in which the project was initially implemented and some as a result of a lack of technical capacity both from the beneficiaries and the technical staff.

Some of these weaknesses include poor apiary selection, poor hive positioning in the apiaries, a lack of knowledge regarding the habits and activities of bees, selection of areas with little or no pasture from which the swarms could gather nutrients and a lack of support and record keeping on the part of some members of the technical team. All of this can be corrected without too much difficulty as detailed on the next chapter of this report (see Figure 14).

There is a need to try and concentrate beneficiaries in areas close to each other in order to facilitate harvesting and the work of the technical staff, if possible it would be a good idea in the future to try and form small groups or associations of beekeepers who put their hives in apiaries together, if the flora in the area will sustain the pressure, which will greatly improve local collaboration between the beekeepers and make the work of the technical staff more efficient by reducing travelling time between beneficiaries and apiaries, there is already one example of such collaboration in the new apiary established by Lucas and his colleagues.



## 2.2. Training and monitoring



*Figure 9 : Theoretical and practical training at the apiary school of the Musseia's Camp.*

### 2.2.1 Objectives



*Figure 10 : Training of selected group of Beneficiaries and Technicians.*

Main objectives of the training were:

- To train technicians and community selected members in sustainable beekeeping practices;
- To build capacity of community members with top bar hives to increase honey production through the multiplication and unification of swarms;
- To improve colonization rates of the bee-hives;



## 2.2.2 Schedule

The beekeeping training schedule is detailed as following:

## 2.2.3 Descriptions of Activities

Dates	Juliano Möller Rodrigues	Heinrich Van Der & Fernando Carvalho
18-19/Feb.	Writing Honey Guide Level 2	
20-21/Feb.	Writing Honey Guide Level 2	
24-25/Feb.	Preparation beekeeping training Level 2	
26/Feb.	Gurué - Gilé	
27/Feb.	Gilé : 1st meeting, organization with technicians GNR	
	Honey Training Level 2 at Musseia Camp	
	(break)	
28/Feb..	Honey Training Level 2 at Musseia Camp	
29/Feb.	Honey Training Level 2 at Musseia Camp	
	Honey Training with Marcelino Pequenino at Namahipe	
01/Mar	Honey Training Level 2 at Musseia Camp	
	Honey Training Level 2 with Lucas & Felisberto at Mihecue	
02/Mar.	Honey Field Monitoring with Mr. João and Filho – Vassele	
	Honey Field Monitoring with Mr. Francelino - Namurrua	
03/Mar.	Honey Field Monitoring with Mr. Omar - Nacurugo	Way back – Musseia – Gurue
04/Mar.	Honey Field Monitoring- with Mr. Felisardo - Muhecuine	
	Honey Field Monitoring with Mr. Sergio - Pipine	
	Debrief meeting : Outcomes + way forward	
05/Mar.	Way back – Musseia - Quelimane	

The previous training developed by Nitidæ and AgriMel within DPO project was held on July 29<sup>th</sup> to August 2<sup>nd</sup> in Musseia Camp and the Buffer zone at NGR. This first training (Level 1) was designed to teach basic practices of sustainable beekeeping. One of the very positive outcomes was the construction of the apiary school by the participants. The second training (level 2) was based on the same methodology, with a selected group of beneficiaries and technicians, to continue these learnings using the apiary schools to apply advanced techniques.



Figure 11: Manual for technicians Level1) and Guide for the beneficiaries Level 1 (Basic training)



Considering this initial basic training (Level 1) with the beneficiaries, the team developed a second training guide (Level 2) for advanced practices in beekeeping (Figure 13). The goals of the training were to teach these advanced techniques of beekeeping such as unification and multiplication of swarms to improve colonization rates. Getting swarms to colonise hives is a key problem in development beekeeping.

The focus group of the training were the technicians of the CDD team and the selected beneficiaries as well. It was a very positive experience because it was possible to discuss the theory in the classroom with the participants and to apply the learnings in practice at the Apiary School, an important pedagogic tool.



*Figure 12 : Applying the theory learned at the classroom in the field.*

The technical guide (Level 2) “Técnicas Melhoradas para o Aumento da Produção do Mel” was delivered to the participants that were satisfied to have the content from all the classes available in their handbooks.





Figure 13 : Guide Level 2 : "Guia de apicultura Técnicas melhoradas para o aumento da produtividade de Mel".

The main technical point learned was the unification of swarms. This technique allows the beekeeper to maintain a very strong swarm, avoiding the tendency of the swarm to abscond the bee-hive. The goal of the training was successfully achieved with technicians and beneficiaries. They learned how to do the inspections properly and acquired the skills to increase the populations of swarms and keep them strong to producer more honey.



Figure 14 : Practices of unification of swarms at the Apiary School - Musseia Camp NRG



## 2.2.4 Monitoring

After five days training days at Musseia Camp, the team went to three days of monitoring the field, visiting 6 apiaries at the buffer zone of the NGR. Going to the northern and southern part of the reserve in five communities: Vassele, Namurrua, Mulela, Muhecuine and Pipine. Some of the apiaries were visited during the training, the monitoring visited lasted two days and 3 apiaries were visited. The program was impacted by a tragic accident and it was combined with other activities from the DDC.

The first beneficiary visited was Mr. João Macunaracha in the community of Vassele. The team carried out the inspections of three hives, observing the new location of two hives installed in December 2019. As mentioned earlier the usual problem of insufficient flowering trees available to provide wild bees for colonising beehives and nectar to make honey (weak swarms lack of food to the bees, biodiversity and native trees). The recommendations are to plant native trees or to let the natural tree regeneration to occur.



*Figure 15: Honey Field Monitoring at Vassele Apiary's*

The second apiary visited is located in Vassele in a better place. It belongs to three beneficiaries. There are three very well organized hives, each hive belongs to a different beneficiary.

The CDD team is organizing and supporting this kind of groups, but there is not yet a clear understanding of what are the activities and responsibilities for each beneficiary and how this will look like in the work and activities in the apiary to avoid some conflicts in the future, such as issues at unifications or harvesting, for example.



*Figure 16: Honey Field Monitoring at Vassele Apiary's*

The third apiary visited with the CDD team and the beneficiary Mr. Francelino is located in Namurrua. It's an apiary reference with a group of selected beekeepers, a very-well organized hives, protected in the right positions, close to the water source and close to the limits of the NGR and miombo forests, It is the perfect place for a pilot to integrate beekeeping and plant native trees.



*Figure 17: Apiary reference located on the border between the community and the NGR.*

The fourth apiary visited with the beneficiary, Mr. Omar is located in Mulela, southern part of the buffer zone of the NGR. There are six hives that belongs to two beneficiaries located in a good place with water source and lots of trees. An interesting and positive note is that the beneficiaries planted native tree seedlings around the apiary.



*Figure 18 : Native and meliferous trees were planted around the apiary.*

The fifth apiary visited with the beneficiary Mr. Felisardo is located in Muhecuine, southern part of the buffer zone of the NGR close to the apiary of Mr. Omar. It's a good place to put the hives as it closes to the forest and water source.



*Figure 19 : Apiary of Mr. Felizardo*



The sixth apiary visited with the beneficiary Mr. Sergio is located in Pipine, southern part of the buffer zone of the NGR.

The same issue mentioned earlier: problems with technical assistance. The hives remain in the wrong positions, with a lot of shade and humidity since the last visit in July 2019. The introduction of sheets of wax to improve the development of the swarm was made wrong, dividing the nest and stimulating the swarm abscond.

There are three beehives with two very strong swarms with possibilities of harvesting. Indicating that this is a very good place with flowering trees and biodiversity.



*Figure 20: Abscond of the swarm cause by incorrect technical assistance.*

## 2.2.5 Next Steps for the Training

It was initially planned in the technical proposal to realize a third training (level 3) which is not possible at the moment because of the constraints due to Coronavirus situation. The experience so far led us to consider the production of a new Guide/Manual with the content of the Training Level 3. The Level 3 is focus on Harvest Techniques to teach appropriate techniques and methods for harvesting a high-quality product at individual level. This manual could be aligned to a remote technical assistance to support the work of the technicians in the field.

The recommendation for next steps is:

- To design the Honey technical Guide Level 3 – Harvesting and processing honey in Portuguese.



## 2.4 Remote Technical Assistance

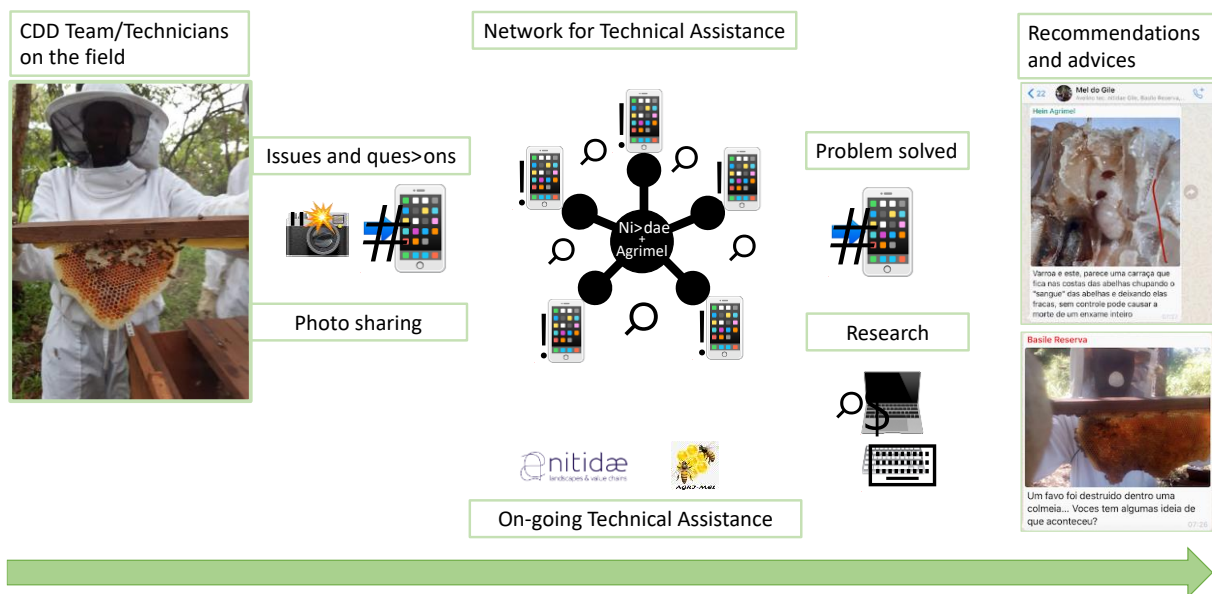


Figure 21 - Process of on-going technical assistance

### 2.4.1 Objective

The purpose of the remote technical assistance is to maintain the flow of support using the Whatsapp Group: "Mel do Gilé" and making a biweekly call to answer questions about specific issues related to the beekeeping work.

### 2.4.2 Remote Assistance

The remote assistance was based on whatsapp group debates, calls and emails between Nitidae, Agrimel and the CDD team. The whatsapp group «Mel do Gilé» it was created to optimize the contact with the team. The main themes during the communication for remote assistance were:

- Support and solve problems related to the apiaries as: swarming, lack of food for bees, pragues and diseases, conflict of species, location for beehives
- Support the development of planning for fieldwork and monitoring
- Advice about beekeeping practices and safety related to specific circumstances of the technicians on the field, such as : bees attacks, procedure to feed the bees and the transfer of swarms.

The remote assistance was productive but not used so much as it could be used. The technicians and the CDD team could be supported with more intensity and frequency throughout the available communication channels.

### 2.4.3 Honey Monitoring Tools

The honey monitoring tools were delivered for technicians and the CDD team during the second training. The tools were:



- Spreadsheet for Inspections at the Apiaries (Annex 3)
- Season flowering calendar for monitoring periods for harvest (Annex 4)
- An example of calendar of activities to be carried out through the year to guide the technicians (Annex 5)

The support on the monitoring continues to be delivered through photo sharing of the beehives for follow up and advice through use of a whatsapp group which includes all technicians, the CDD management team and the technical staff of Agri-Mel and Nitidae.

Record keeping of activities carried out in the apiaries and observations made during hive inspections are vital to developing an idea of how the swarms are developing and when there are periods of dearth or lack of nutrients for the bees in order to be proactive and take measures early to prevent the loss of colonies and guarantee production. Record keeping will also develop a picture of peak honey production cycles to maximise harvesting and through obviously income generation. It is vital to manage the hives properly and be rigorous in the control of pests like ants and termites to avoid absconding

#### 2.4.4 Next Steps Technical Assistance:

Based on the learnings from the technical assistance delivered so far, the recommendations are:

- To maintain weekly calls with the CDD team for custom support for the demands
- To use pictures to be able to monitor and advise the beehive management
- To create a shared data base to be updates by the CDD team about the improvement of the swarms
- To develop an updated map of the apiaries
- To support the development of bait-hives as the strategy to increase the swarm population

### 3 Conclusion

CDD team's on-going work with the beekeepers to improve knowledge and monitor the beehives is necessary to ensure the harvesting in the future.

One of the most positive points of the experience is having centralized apiaries, forming small groups and creating collective apiaries. This facilitates technical assistance and monitoring and encourages associations between beekeepers.

During the fieldwork and we saw some challenges of monitoring. The constant monitoring and follow-up with guidelines and instructions are fundamental for the improvement of the apiaries and to have some "success story" with beneficiaries to incentive other communities' members to be interested in honey beekeeping. A workplan and an organized calendar for honey production at GNR could be developed to support the technical work and to motivate monitoring activities.

In summary, *Apis mellifera scutellata* is a very productive bee species and excellent for honey production. The species also has some characteristics which have developed from centuries of co-existence with honey hunters, wildfires and predators which can make it very difficult to maintain the swarms in the hives. During periods of dearth or lack of nutrients this species has a very strong



tendency to abscond in order to migrate to areas where more nutrients are available and if not properly managed this can be a problem for aspiring beekeeping projects.

Many community beekeeping projects fail because people have a very romanticized view of beekeeping and do not realize that it requires a lot of time and attention. A lack of capable technical assistance and adequate training of the technical staff and beneficiaries as well as constant monitoring of the beneficiaries is another shortcoming of many projects. It requires a minimum of two years of technical assistance for a beneficiary to become more or less proficient as a beekeeper, in some cases more. Adequate record keeping of activities carried out in the apiary and observations made during inspections are of paramount importance. This process will help to develop a picture of how the bees develop during the different periods of the year as well as indicating periods of lack of nutrients which enable to measure what is needed to avoid swarms absconding.

Considering the above, the remote assistant should continue and the next deliverables shall be:

1. A note with comments on GNR roadmap for honey value chain,
2. A technical guide Level 3 with drawings/schematic/photos, in Portuguese, including harvesting and processing honey.
3. A final report (Including market study and strategic recommendations for Honey value chain development).





## Annex 1 – Detailed activities of the training

Data	Conteúdo	Duração	Metodologia	Participantes	Local
<b>27/Fev.</b> <b>Manhã:</b>	Apresentação das actividades do treinamento. Entrega Guia de Apicultura Level 2	1h30	Palestra	Técnicos	Acampamento de Musseia - RNG & Apiário-Escola
	Principais fatores de produtividade	1h	Aula teórica	Técnicos	
<b>Tarde:</b>	Técnicas Avançadas Divisão e união de colméias	1h30	Aula teórica	Técnicos	
	Unificação de enxames fracos	2h	Aula Pratica	Técnicos	
	Roda de conversa: questões e dúvidas da pratica	30min	Aula Pratica	Técnicos	
<b>28/Fev.</b> <b>Manhã:</b>	Melhorando as taxas de povoamento Captura de enxames migratórios	1h	Aula teórica	Técnicos + Beneficiários	Apiário-Escola Acampamento de Musseia-RNG
	Retirada e transferencia de enxame fixo para a colmeia Lanstroth	1h	Aula Pratica	Técnicos + Beneficiários	
<b>Tarde:</b>	Observação e inspeção das colméias do Apiário-Escola	1h	Aula pratica	Técnicos + Beneficiários	
	Sessão de dúvidas e conversa sobre o trabalho realizado.	1h	Aula pratica	Técnicos + Beneficiários	
<b>29/Fev.</b> <b>Manhã:</b>	Procedimentos para evitar enxameação	1h	Aula teórica	Técnicos + Beneficiários	Apiário-Escola Acampamento de Musseia-RNG
	Método do Ninho Claro: intercalação de ceras novas alveoladas	1h	Aula teórica	Técnicos + Beneficiários	
<b>Tarde:</b>	Treinamento Apiário Sr. Marcelino Pequenino: Manejo e Inspeção colméias	1h	Aula pratica	Técnicos + Beneficiarios	Namahipe
	Aplicação Método de intercalação de ceras.	1h	Aula pratica	Técnicos + Beneficiarios	
<b>01/Mar</b> <b>Manhã:</b>	Técnicas Avançadas União de colméias	1h	Aula teórica	Técnicos + Beneficiarios	Apiário-Escola Acampamento de Musseia-RNG
<b>Tarde:</b>	Visitar para observação apiario referencia – Lucas e Felisberto	1h	Aula pratica	Técnicos + Beneficiarios	
	Finalização – Entrega de certificados	1h	Aula pratica	Técnicos + Beneficiarios	





## Annex 2 – List of presence

Nome	Organização
Fernando Bondi	RNG – FFS - IGF
Basile Guillot	RNG – FFS - IGF
Justina Alves	RNG – FFS - IGF
Graciano Olimpo	RNG – FFS - IGF
David dos Santos	RNG – FFS - IGF
Cesária M. da Silva	RNG – FFS - IGF
Tovolé	RNG – FFS - IGF
Juliano Möller Rodrigues	Nitidae
Heinrich Van der Merwe	Agrimel
Fernando Carvalho	Agrimel
Julio sabonete	Beneficiário
Sérgio Agostino	Beneficiário
Alide Pedro Rojolino	Beneficiário
Pedro Agostinho	Beneficiário
João Muancrusa	Beneficiário
Domingos João Afonso	Beneficiário
Rogério João	Beneficiário
Lucas Daniel	Beneficiário
Felisberto Francisco	Beneficiário
Armando	Beneficiário
Marcelino Pequeninino	Beneficiário
Omar Alberto	Beneficiário
Alberto Rio Maleco	Beneficiário
Rui da Silva Francisco	Beneficiário
Felizberto Alface	Beneficiário
Anselmo Armando	Beneficiário
Alfredo Juma	Beneficiário
Cardoso Francisco	Beneficiário
Domingo João Sinho	Beneficiário



## Annex 3 – Spreadsheet for Inspections at the Apiaries

### Ficha Individual de Colmeia

Apicultor: \_\_\_\_\_ Localidade: \_\_\_\_\_ NO.Colmeia: \_\_\_\_\_  
Apiário: \_\_\_\_\_ Supervisor: \_\_\_\_\_ Data de Povoação: \_\_\_\_/\_\_\_\_/\_\_\_\_

Data de Visita	Enxame B/M/F	Reserva de Pólen	Reserva de Mel	Presença de Rainha	Espaço na Colmeia	Pronto para Colher	Melgueira	Observações/Próxima intervenção



## Annex 4 – Season flowering calendar for monitoring periods for harvest

Calendário De Floração de Espécies Nativas														
Nome Inglês	Nome Vernacular	Nome científico	Meses de Floração											
			Jan	Fev	Mar	Abr	Mai	Jun	Jul	Ago	Set	Out	Nov	Dez
African Ebony		<i>diospyros mespiliformis</i>												
African Mangosteen		<i>Garcinia livingstonei</i>												
Apple Leaf		<i>Philenoptera violacea</i>												
Baobab	Mbondeiro	<i>Adansonia Digitata</i>												
Chocolateberry		<i>Vitex payos</i>												
Crystalbark		<i>Crossopteryx febrifuga</i>												
Eared Senna	Acasia	<i>Senna petersiana</i>												
False Tamboti		<i>Cleistanthus schlechteri</i>												
Green monkey orange		<i>Strychnos spinosa</i>												
Lalapalm		<i>Hyphaene coriacea</i>												
Large Sourplum		<i>Ximenia caffra</i>												
Mahobohobo		<i>Uapaca kirkiana</i>												
Mobola Plum		<i>Parinari curatellifolia</i>												
Munondo		<i>Julbernardia globosflora</i>												
Musasa		<i>Brachystegia spiciformis</i>												
Narrow Leaved Mahobohobo		<i>Uapaca nitida</i>												
Ordealtree		<i>Erythrophleum africanum</i>												
Panga Panga	Jambiri	<i>Milletia stuhlmannii</i>												
Peanut butter Cassia		<i>Senna Didymobotry</i>												
Pod Mahogany (Chamfuta)	Chanfuta	<i>Azalia quanzensis</i>												
Prince of Wales Feathers		<i>Brachyegia Boehmii</i>												
Red Bushwillow		<i>Combretum apiculatum</i>												
Red Mahogany	Mbaua	<i>Khaya anthotheca</i>												
Sand Jasmine		<i>Schrebera trichoclada</i>												
Sandpaper Bush		<i>Ehretia amoena leaf</i>												
Scotsmans Rattle		<i>Amblygonocarpus Andongensis</i>												
Sicklebush		<i>Dichrostachys cinerea</i>												
Silver Clusterleaf		<i>Terminalia sericea</i>												
Stink-Bushwillow		<i>Pteleopsis myrtifolia</i>												



## Annex 5 – An example of calendar of activities to be carried out through the year to guide the technicians

ATIVIDADE	JANEIRO	FEVEREIRO	MARÇO	ABRIL	MAIO	JUNHO	JULHO	AGOSTO	SETEMBRO	OUTUBRO	NOVEMBRO	DEZEMBRO
Reduzir o alvado e colocar entre tampa ou poncho				X	X							
Verificar estoque de alimento (mel e pólen) e se necessário alimentar	X	X	X	X	X	X	X	X	X			
Monitoramento de varroa e se necessário controle	X	X		X	X		X	X				
Colheita de mel										X	X	X
Colheita de mel de eucalipto				X	X							
Colheita de melato			X	X	X	X	X					
Troca de favos velhos	X						X	X	X	X	X	X
Colocação de sobreninho ou melgueira									X	X		
Abertura de alvado e retirar entretampa ou poncho									X	X		
Fazer núcleos	X	X							X	X	X	X
Seleção de colmeias, teste de comportamento higiênico e troca de rainhas	X	X								X	X	X
Multiplicação de enxames	X	X										
Unir enxames fracos				X	X							
Unir enxames de rainha velha ou pouco produtiva com núcleo de rainha nova								X	X			
Semeadura ou plantio de pastagem apícola				X	X			X	X	X		