Supporting the development of a sustainable cashew value chain in Banhine National Park

First mission report - November 13 - 17, 2023

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anitidæ cadeias de valor & territórios

PARQUE NACIONAL DA BANHINE MOÇAMBIQUE

ANAC ADMINISTRAÇÃO NACIONAL DAS ÁREAS DE CONSERVAÇÃO

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1. Context

The Peace Park Fondation (PPF), co-manager of the Banhine National Park (PNB) aims to develop a sustainable cashew value chain, as a new and additional cash crop, to support communities and farmers' livelihoods.

PPF is partnering with Condor Anacardium (a cashew nut processor in Macia, Gaza province) and NITIDAE to provide technical assistance to the Cashew Program of the Community Department of Banhine National Park.

2. Presentation of Nitidae

Nitidæ is a French NGO whose aim is to define, develop and implement projects that combine environmental protection and the strengthening of sustainable economies.

Nitidae has been working in Mozambique since 2013 and brings together sectoral and complementary expertise, on agriculture, markets and value chains, and on the other hand: forestry, conservation, bioenergy, climate and carbon project development; it creates an innovation interface to propose integrated solutions for the sustainable development of African rural territories.

Nitidæ also provides technical support for companies wishing to improve the performance of agricultural value chains, mitigate their impact on the environment (preservation of natural resources, energy efficiency of processing, carbon offsetting of activities) and stimulate local economic development.

With 25 years of experience in the cashew sector, Nitidae is the forerunner of cashew certification in West Africa, establishing successful partnerships with processors, exporters and producer organizations in Africa (Anatrans, Gebana, Olam, IPS, Dorado, Condor, etc.), developing the N'kalô Market Information Service.

For 10 years, Nitidae has been working in partnership with the PNAG on sustainable livelihoods for slash-and-burn agriculture and the cashew value chain around the PNAG, focusing on establishment:

- of the first certified REDD+ project in Mozambique (2013-2016).
- a sustainable cashew value chain on suitable land, without creating deforestation (ACAMOZ Project).
- the sustainable management and enhancement of non-timber forest products (honey, mushrooms).
- conservation agriculture to reduce the loss of soil fertility and deforestation.

3. Purpose of the consultancy

NITIDÆ aims to establish technical assistance over 20 months from November 2023 to support the PPF team in developing and implementing a sustainable cashew value chain in Banhine National Park (PNB).

NITIDÆ will assist the BNP Community Department in:

- Build an implementation plan and a monitoring and evaluation (M&E) system with associated indicators.
- Understand the key principles, challenges and safeguards for the development and implementation of a sustainable cashew nut value chain around BNP;
- To help identify intervention communities, beneficiaries and suitable land for planting new cashew orchards;
- Technical support for the best cashew management practices, in an initial or productive phase, including the planting of new orchards (note that the new orchards will not reach a productive phase during the duration of the service);
- Training on structuring farmers' groups, strengthening capacities and links to the market (with Condor);
- Understand the cashew value chain and market;

4. Approach & Methodology

To achieve the objectives mentioned above, NITIDAE will:

- Ensuring dynamic remote technical assistance to the BNP Community Department team through the WhatsApp group and virtual meetings throughout the consultancy to guarantee adequate support whenever it is needed (on a regular or "when needed" basis).
- Carry out four (4) field missions in BNP together with the Community Department team.

5. Agenda of the first mission in BNP

The first mission was carried out between 13 and 17th of November 2023 by Mr. Jean-Baptiste Roelens (Nitidae Mozambique Representative) and Ms. Charline de Rouvroy (Nitidae Mozambique Cashew Production Expert) together with the Community Department Team, namely: Mr. Herculano Ernesto (Community Coordinator), Mr. Paulo Chambisse (Community Officer), Mr. Moises Machava (Cashew Program Technician), Ms. Alfa Tomas Bendzane (Environmental Awareness Officer).

A briefing meeting on the objectives of the mission as well as a presentation of the first results after the visits and meetings in four (4) communities around the Park were held on November 14 and 16 with the presence of the Community Department as well as Mr. Abel Nhabanga (BNP Administrator), Mr. Romualdo Uaila (Head of Operations and Development), Mr. XX (Protection Coordinator).

The mission agenda is available in Annex 1.

6. Field observations after visits with targeted communities

a. What to remember about the words of the members of the CGRNs?

Figure 1. Photographs of the meetings and field trips

1. Cattle problem

- CGRN Tchai Tchai "*we need netting/iron wire to protect the cashew trees*"

2. Request to plant cashew trees, individually (for each household and not jointly)

- CGRN Gerez & Hochane: "*we want to receive our own plants and not have a common CGRN field*"
- Mr. Xadreque from the community of Tchai Tchai (who owns a small cashew orchard): "*the joint orchard had never worked*".

3. ADRA / SDAE cashew experiment

- CGRN Tchai Tchai: "*fence against cattle are unkept, destruction of plantations*"
- SDAE: "*producers are lazy*"

Growers' messages and experiences are very important and should be taken into account. At Nitidae, we don't believe that producers are "lazy". In many circumstances, it is the lack of understanding of territorial dynamics and crop and production systems, and the rationality of producers (land, work schedule, workforce, access, constraints, etc...) that do not allow for an adequate definition of support programs in the agricultural sector.

In order to better understand the "reality" of the producers and ensure the relevance of the technical support activities that can be chosen, Nitidae has developed **a methodology called "agrarian diagnosis".** Since the communities around Banhine National Park are socially structured around livestock production, which is the economic pillar of the families, the fundamental question is to understand how cashew production can be integrated into this **agro-pastoral diagnosis**.

b. Approach on the agro-pastoral diagnosis

Since the BNP Community Department was created recently, the knowledge available on the agricultural and pastoral systems of the communities in the BNP buffer zone is still limited, despite the fact that the *Herd for Health program* has already started, which deals with the issue of sustainable pasture management.

The main objective of an agro-pastoral diagnosis is to understand the territorial dynamics that influence agricultural development and land use, in order to identify the different strategy of agro-pastoral productions.

An agro-pastoral diagnosis is a long, in-depth study carried out through several cycles of surveys and analysis of the data collected. Although Nitidae has the mandate to support the BNP in monitoring the planting of cashew trees, in this paragraph we present the methodology of agro-pastoral diagnosis in order to explain better the approach used during this first field mission.

During this first field mission, NITIDAE had the specific objectives of:

- To observe the landscape;
- To better understand the reality of each producer and the dynamics of the intervention area in terms of the distribution of land ownership among families, farm incomes and work schedules;
- To understand the agricultural and pastoral system, in order to integrate better the production of cashew trees around BNP in an area of high cattle breeding;
- To understand with producers, challenges encountered in the cashew production system, practices (intercropping with food crops, for example) as well as the impact of animals (cattle, goats and wild animals).

The methodology to achieve this is to observe and question the producers in order to understand their strategies and limitations. Producers always have good reasons for doing what they are doing. Those reasons are not just agronomic. That's why a diagnosis is a systemic and multidisciplinary tool.

Based on the observations and informations received from the producers, we usually established a typology/profile that allows us to classify each farmer into a specific type.

- Each producer profile defines the major trends in production, land distribution and sales.
- Establishing a typology is a complicated task because the reality of an agricultural area can be extremely complex.

Figures 2 & 3 below show the observations and analysis of the agro-pastoral system and the cashew production system. It should be remembered that a complete agro-pastoral diagnosis is a vast undertaking and that those observations were made in a short period of time in order to try to guide the reflections of BNP Community Department, which must adopt a posture of constant questioning in its discussions in the communities in order to continuously deepen its understanding of agro-pastoral dynamics and practices.

Agro-pastoral system of the communities around Banhine National Park

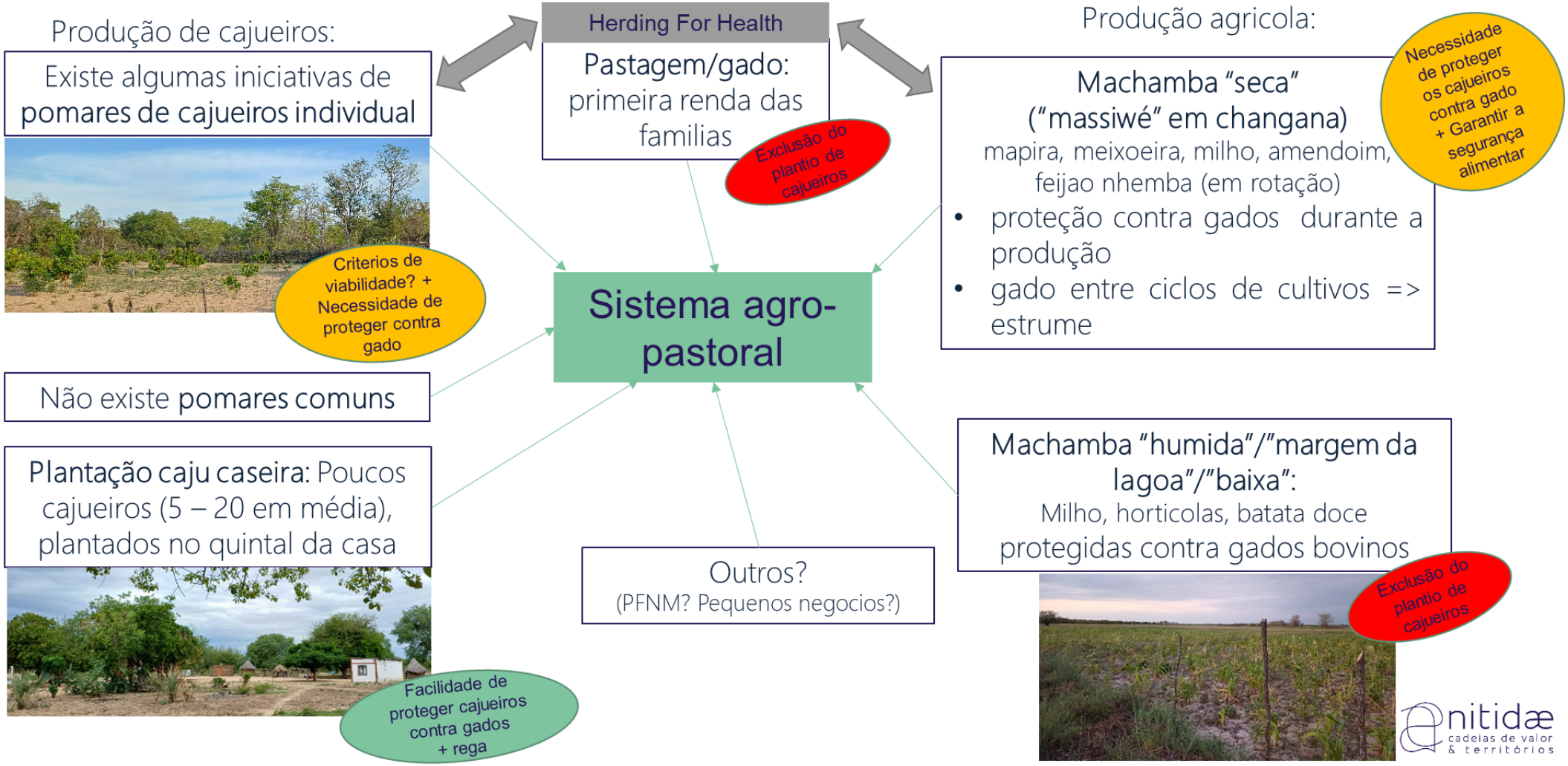

Figure 2. "Quick" diagnosis of the agro-pastoral system of the communities around BNP

Cashew production system in the communities around Banhine National Park

Figure 3. "Quick" diagnosis of the cashew production system in the communities around BNP

Based on those observations during this first visit, we recommend that the Banhine Community Department work in continued synergy with the *Herding For Health Program:*

- To know the areas of habitation, cultivation and common grazing land, based on existing mapping;
- Cattle grazing areas as well as wetlands (swamps and lowlands) should be excluded from cashew planting to minimize the risk of trampling and also since wetlands are not suitable for cashew trees;
- Cashew trees still need to be protected from cattle and wild animals in the first two years;
- Talk specifically about living hedges for parking animals (see paragraph below) and plants of interest to livestock (thorns, euphorbias and trees of interest to livestock);
- Already degraded/open areas should be chosen for the establishment of cashew orchards to avoid creating deforestation;
- We recommend including the pastoralists of the livestock (adults and children) in the discussions, including the pastoralists of the H4H Program on agriculture/cashew with the CGRNs to allow good coordination within the community and avoid embarrassment with animals.

NITIDAE realized that there are two committees at community level: *Healthy Livestock Committees* and *Natural Resource Management Committees (CGRN)*; as well as two programs at Community Department level: 1/ Cashew Program and 2/ H4H - Healthy Livestock Program.
As mentioned in the Management Plan, the CGRN is "*a* community-based *organization*" ... "*which could lead to better representation of the communities*" ... and which makes it possible to "*contribute significantly to more sustainable management of natural resources in the buffer zone and better adherence to the rules and regulations governing the park*".

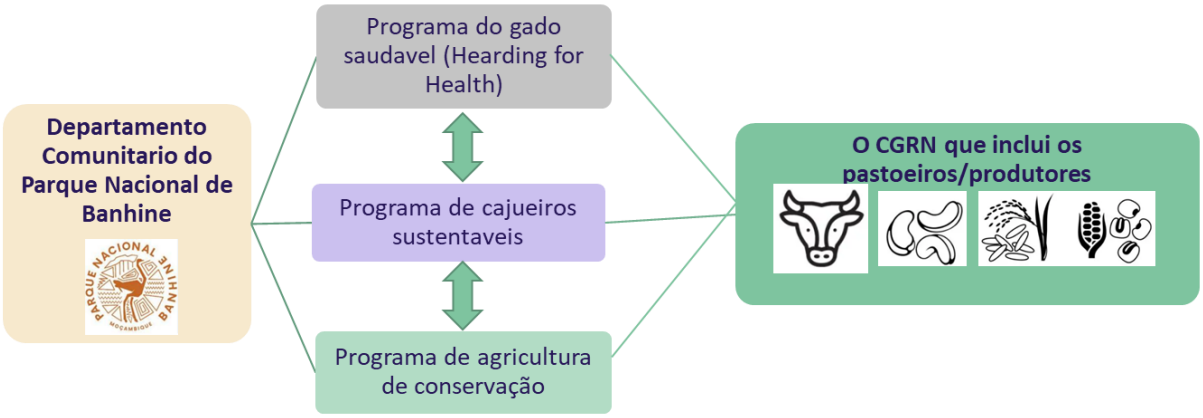

Figure 4. Optimization scheme for the development of community programs between BNP and the surrounding community.

Thus, as shown in Figure 4, we recommend that the organizational structure of programmes at the Community Department level should not be replicated at the level of communities and CGRNs. We note that there is an insufficiently integrated approach at community level.

As explained above, producers will evaluate the interest of cashew considering their entire agro-pastoral system. It is therefore essential that the Community Department integrates its programs in

the same way so as to speak with a single voice at the level of the CGRNs and have cohesion between the producers/pastoralists gathered in a single committee (CGRN) that represents the community as a whole.

On another subject, for Integrated Cashew Management (ICM): cashew trees, if attacked by diseases, need to be sprayed with chemicals, the only current solution available in Mozambique and Tanzania against the main disease, powdery mildew. This is an important information to take into account in the landscape of the Banhine National Park buffer zone, a conservation area. However, today in Mozambique some alternatives with organic products are being experimented with, by some partners including NITIDAE and the Instituto das Amendoas de Moçambique (IAM,IP) in the provinces of Nampula and Zambezia. It is therefore very important for the Community Department team to understand the incidence of cashew disease (and pests) with producers in BNP buffer zone.

At the community level, NITIDAE has succeeded in working with the CGRNs around Gilé National Park on other topics linked to agriculture such as conservation agriculture (leguminous plants intercropping, concepts of living or dead cover, crop rotation) and improved seed conservation for beans and maize. These trainings are available in Annex 2.

7. Proposed technical itinerary for planting cashew trees

On the basis of the observations made, NITIDAE proposes two (2) technical itineraries (TI) for the members of the CGRNs:

→ **TI#1: Planting cashew trees in the backyard**

→ **TI#2: Implementation of an individual cashew orchard**

The decision to choose the technical itinerary, compass between plants and number of seedlings must be based on the wishes of the household and the availability of the land, based on the recommendations, positive points and limits issued by the Community Department (described in the part bellow for each IT).

In addition to the two (2) technical itineraries mentioned above, NITIDAE also recommends two (2) experiments that are other options for planting cashew trees that do not exist in the landscape but could serve as a pilot test, depending on the wishes of one or two households/CGRN and the availability of land:

→ **EXP#1: Cashew trees integrated into the individual "dry" field**

→ **EXP#2: The implementation of living hedges with cashew and other** trees

NITIDAE does not recommend, at the beginning of the Cashew Program, the **implementation of a CGRN cashew orchard (either managed jointly or in seperate blocks).** This idea came up during discussions with the Community Department Team but EXP#1 and EXP#2 seem more realistic and will have more buy-in at community level compared to the CGRN cashew orchard. The producers were clear in all the meetings about the irrelevance of implementing a joint orchard (like a demonstration field):

- represents a lot of additional work for the producer,

- is a challenge in terms of management and the question of land ownership.

→ Until all questions of understanding of the system are answered and after the recent creation of the CGRNs, it seems too risky for BNP to implement a joint orchard in a CGRN.

a. TI#1: Planting cashew trees in the backyard

As mentioned in Figure 2, there are currently a few cashew trees (5-20 on average) planted in the backyard of the household in the communities surrounding the Park (Figure 6). This existing technical itinerary is a first option for the members of the CGRNs:

TI#1 Positive points:

Plantação caju caseira →

- Já existe na paisagem da zona tampão de Banhine
- Facilidade pela família de proteger os cajueiros contra gados
- Facilidade pela família de regar as mudas
- Forte demanda da parte da comunidade

Recommendations:

- Beneficiaries: 1/ members of CGRN 2/ select interested and motivated people from the community, to create links with them, including from the H4H Program
- Compass suggestion: 10x10m or 12x12m (space saving)
- Suggested number of seedlings per family: 05 to 20

Limits:

- Plantations with few cashew trees = low volume of cashew nuts
- We recommend making the seedlings available to nearby households to make it easier to aggregate the product when it comes to marketing.

Figure 5. Technical itinerary TI#1

Figure 6. Cashew trees planted in the backyard of the house

To protect plants from cattle, we recommend these techniques:

- With thorny plants and/or euphorbias (Figure 7) if they are found in the intervention zones, as in the case of Senegal;

- With **wooden stakes (Figure 8).**

Figure 7. Protection of plants with thorns and/or euphorbias (Nitidae, 2023)

Figure 8. Protection with stakes

b. TI#2: Implementation of an individual cashew orchard

As mentioned in **Figure 2**, there are some individual cashew orchard initiatives, such as here in the community of Tchai Tchai (**Figure 9**).

Figure 9. Plantation of 50 cashew trees in Tchai-Tchai, protected from cattle and wild animals

TI#2 Positive points:

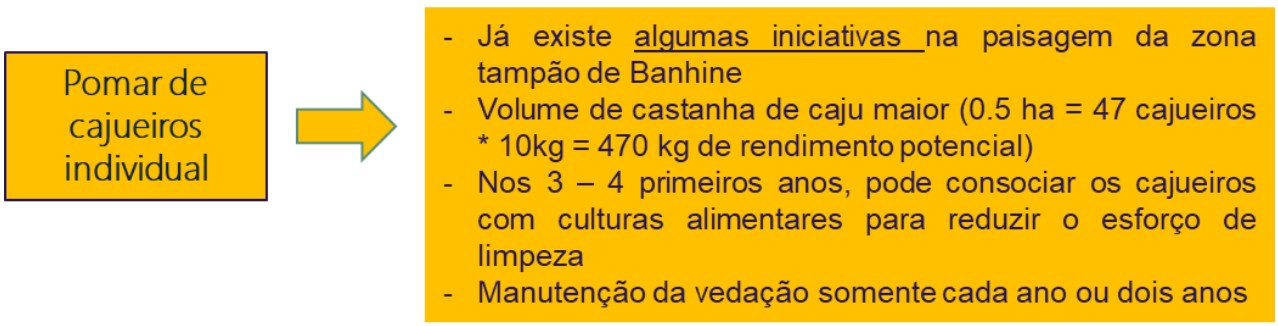

Figure 10. Technical itinerary TI#2

Recommendations:	Limits:
• **Beneficiaries:** 1/ members of CGRN 2/ select interested and motivated people from the community, to create a link with them. • **Compass suggestion:** 10x10m or 12x12m (space saving) • **Suggested number of seedlings per family:** we recommend an area of **0.50 ha maximum**, either 50 seedlings (10x10 compass) or 40 seedlings (12x12 compass).	• Necessary strong fence against cattle and wild animals that needs maintenance every year or two years: with thorny plants and/or euphorbias, moringa (if available) • Land availability • It represents additional work for the sealing and cleaning producer • We recommend close coordination with H4H to implement this orchard in areas outside the pasture to minimize risks.

Figure 11. Live hedge to protect a cashew orchard, West Africa (Nitidae, 2023)

The pilot experiences that BNB could implement with some producers are as follows:

c. EXP#1: Cashew trees integrated into the individual "dry" field (*massiwé*)

As mentioned in **Figure 2**, there are fields in the dry areas ("*massiwé*" in Changana), outside the grazing area, where farmers produce mapira, meixoeira, maize, peanuts and nhemba beans. These fields are protected from cattle and animals such as kudos and antelopes during the production of food crops, with a physical barrier. But sometimes, between cycles, they let the cattle in for the sake of soil fertility thanks to the cattle droppings, which allows them to maintain production on the same field for more than ten years.

The planting of cashew trees in the "machamba seca" or "*massiwé*" should not compete with food crops for reasons of food security. For this reason, **we recommend trying this type of cultivation only with a few producers** (2 or 3) who are already aware, or properly sensitized, about the effect of growing cashew trees that create shade and in fact compete with food crops.

EXP#1 Positive points:

Cajueiros integrados na Machamba "seca" individual ou "*massiwé*"
/!\ Segurança alimentar

- Não existe na paisagem de Banhine
- Necessidade de garantir a segurança alimentar da familia: uma sensibilização importante a fazer sobre o facto que o cajueiro vai ocupar espaço e fazer sombra => existe um risco de competição entre os cajueiros e a produção de cereias.

Recommendations:

- **Experimenters:** 2-3 producers interested and aware of the effect of growing cashew trees and the issue of food security
- **Compass suggestion:** 15x15m or 20x20m to ensure the development of food crops
- **Suggested number of seedlings per family:** depends on the size of the field, but it's best to start with a small field: between 0.5 and 1 ha.

Limits:

- Existing fence that needs maintenance every year or two: with thorny plants and/or euphorbias, moringa (if available)
- We recommend close coordination with H4H to implement this pilot in areas outside the pasture, to minimize risks.

Figure 12. Pilot experiment EXP#1

d. EXP#2: Implementing living hedges with cashew trees and other trees of interest

We also recommend as a pilot experiment, the **planting of living hedges with cashew trees, and trees of interest such as euphorbias and thorn trees** around the grazing areas, as in the case of Senegal (**Figure 13 & 15**). For this pilot experiment, the Community Department should work in continuous synergy with the Healthy Livestock Management Program - Herding For Health - to build on the existing mapping:

- housing areas;
- the cultivation areas;
- common grazing areas,
- the existing livestock parks: do they already exist? Or is it an activity to be implemented?

Figure 13. Photograph in Senegal of a living hedge with cashew trees in an area where cattle graze (Nitidae).

EXP#2 Positive points:

Sebes vivas com cajueiros e outros arvores de interesse

- Varios objectivos das sebes vivas: delimitação de terras, proteção dos gados contra animais salvagens (recinto), proteção gados contra as culturas alimentares, produção de forragem (se escolher arvores de interesse pelo gado)
- Sebe viva com aproveitamento da renda da castanha
- Escolha dos arvores: consociação de cajueiros com arvores de interesse: eufórbias e espinhoso bem como árvores forrageiras que podem servir pelos gados

Recommendations:

- Experimenters: Mr. Xadreque (Tchai Tchai) who are part of the H4H Program
- Compass suggestion: 1x1m with straight seeding
- Suggested number of seedlings per family: depends on the size of the hedge

Limits:

- Planting in the rain and in the absence of livestock
- We recommend close coordination with H4H to implement living hedges in pasture areas

Figure 14. Pilot experiment EXP#2

Figure 15. Photograph in Senegal of a living hedge with cashew trees in an area where cattle graze (Nitidae).

e. How can the Community Department continue the agro-pastoral diagnosis in the buffer zone of Banhine National Park?

In order for the Community Department to get closer to carrying out an agro-pastoral diagnosis and understand better the reality of each producer, the agro-pastoral dynamics of the area and the integration of cashew trees in a semi-arid landscape, we recommend carrying out a survey that can be done in the target communities.

→ Nitidae thinks it's important for the Community Department team to see these dynamics from the producers' point of view and to understand the challenges they face. A list of questions can be found in **Annex 3**.

8. Implementation plan

Based on the technical itineraries mentioned in the previous section and discussions with the Banhine National Park team, the implementation plan is as follows:

a) Identification of targeted communities
b) Methodology for identifying and selecting households and planting fields
c) Transportation and delivery of cashew seedlings

a. Identification of targeted communities

During the debriefing meeting of NITIDAE's first mission in Banhine, 2 implementation zones for the cashew program were chosen together with the Park Team, based on the selection criteria:

1. Access to the agricultural market: routes for current agricultural products, including cashew nuts. This criterion helps to understand the routes of existing products and to get to know potential traders (for agricultural products including cashew nuts). + Logistics for monitoring the BNP and transporting seedlings: to facilitate logistics with the trucks that will bring the seedlings, it is good to know the state of the roads and the distances.
2. Synergy with the H4H program: the importance of planting cashew trees in areas where the control of cattle wandering is more advanced.
3. Need to improve the relationship between the BNP and a community: considering tensions linked to limited access to and use of natural resources, the Park can prioritize the development of its community support program in these communities, with cashew as one of the possible interventions.

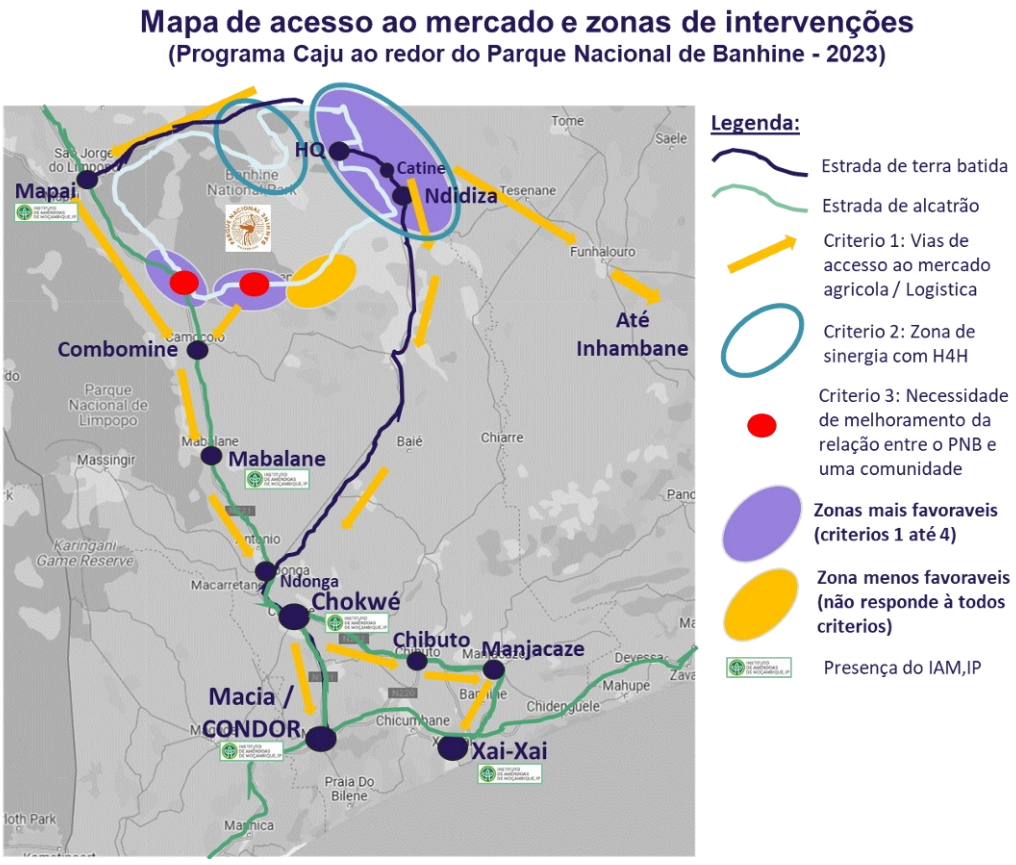

Figure 16. Map of agricultural market access in Gaza province (2023)

→ Based on those criteria, the maps (Figure 16 & 17) show the most favorable CGRNs for implementing the Cashew Program with:

- On the east side: Zinhane, Tchove and Tchai-Tchai
- On the west side: Hochane, Gerez, Mongaze

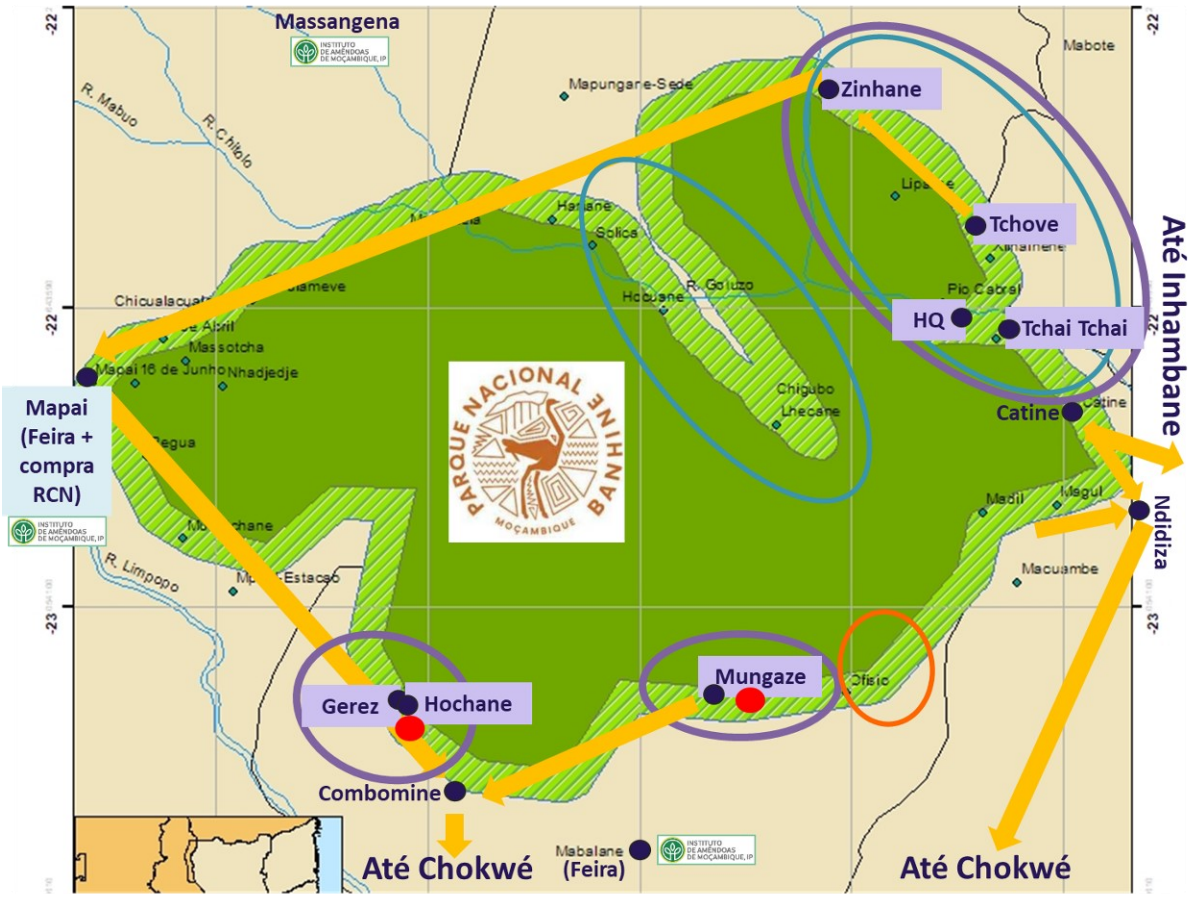

Figure 17. Map of agricultural market access and areas of interventions by the Cashew Program of Banhine National Park (2023)

b. Methodology for identifying and selecting households and planting fields

Once the six targeted communities have been confirmed, **the Community Department team will have to identify the beneficiaries who will receive the cashew seedlings during the first half of December**.

NITIDAE recommends the following selection criteria:

- Motivated member of the CGRN;
- Motivation of the household: the discussion with the beneficiary, together with the site visit, are key to assessing the appropriate technical route (availability of space at home and/or in a field, decision on density/compass). You should also assess how serious the producer is about taking responsibility for preparing the land (pits, compost or manure) and providing the care needed for the cashew trees to survive, particularly during the first 2 years (watering if possible during the first year, mulching and protecting the plants from animals, cleaning up against fire).

- Consider the household as a beneficiary: all family members should have the opportunity to participate in the training given by the PPF Technician over time; Encourage the participation of women and young people in training and discussions.
- The importance of not spreading out within the same community and trying to concentrate on a perimeter;

Considering the limited means of transport and the constraints of the area (distance, roads), we suggest involving other colleagues from the Community Department, as well as technicians from the SDAEs and IAM,IP in the target communities to implement the following steps:

To help with the selection of beneficiaries, we recommend 1/ an explanatory meeting with each selected CGRN, and as suggested above - together with members of the H4H program if you have one, to explain the objective of the program, the household commitments and those of the Park mentioned above. In Annex 4, a model of terms of commitment used in Zambézia to inspire discussions during the meeting. We do not suggest formalizing these terms in writing as we note that people in the communities are wary of signing documents.

Figure 18. Program by the BNP Technician from the selection of the household to the follow-up of the planting.

Once the households that are going to benefit from the cashew seedlings have been selected, as mentioned in Figure 18, the BNP technician must:

2/ select and prepare the fields together with the producers (Planting training available in Annex 5 + Model form for field preparation and seedling delivery available in Annex 6):

→ We recommend starting with **cashew plantations in the backyard (IT#1)** to ensure member satisfaction and greater certainty of good results (this could include producers outside the CGRN, particularly members of the H4H program).

→ We then recommend**, if land is available and the household is willing to do so, to implemente some individual cashew orchard (IT#2).**

→ **For the sake of experimentation, we recommend trying pilot experimentation #1 (EXP#1) only with a few producers (2 or 3)** who are already aware, or properly sensitized, to the effect of growing cashew trees that create shade and in fact compete with food crops.

→ Regarding **pilot experimentation #2 (EXP#2),** we suggest**,** as written in Part 7 of the report, a specific discussion with the H4H program in order to discuss animal parking issues with living hedges that can integrate cashews. If the interest is confirmed with the H4H team, the experiment should be carried out with a pre-identified producer. For example, Mr. Xadreque from Tchai Tchai, who is the shepherd of the H4H program and has a cashew orchard, has a good appreciation of the two themes, cashew and livestock, which we try to reconcile and may be interested in testing new practices.

3/ receive and distribute seedlings DURING THE RAINY SEASON (Model form for field preparation and delivery of seedlings available in Annex 6):

→ We recommend **taking advantage of the rainy season** to plant the cashew trees and planting them **properly,** following the technical recommendations available in **Technical Training #1 on planting** to **reduce the risk of water shortages in the region**.

→ We recommend **protecting the seedlings from cattle when** planting to minimize the risk in the area.

4/ Follow the planting of cashew trees:

→ Need for **training on good post-planting practices** and **Integrated Cashew Tree Management (ICM)** - These trainings will be carried out during NITIDAE's second and third missions to BNP (in 2024).

c. Transportation and delivery of cashew seedlings

After discussions with the PNB, the IAM,IP and Condor Anacardium, the current situation regarding the production and logistics of AICAJU seedlings is as follows:

- Logistical difficulties in bringing seedlings in large pots to the East Zone vs. the West Zone. One (1) truck can transport between 1,000 and 1,200 seedlings.
- The question of the poor quality of the grafted seedlings: we have no information on the origin of the seeds or the forks, and the IAM,IP technician we met at the nursery mentioned that the seedlings would not be suitable for the northern part of the province, which is the semi-arid zone where the target communities are located.
- Timing of the availability of Condor Anacardium seedlings in relation to the rainy season: on November 19, NITIDAE visited the Condor Anacardium nursery where there were 1,600 seedlings already grafted two weeks ago and 5,950 potential seedlings to graft, with a grafting target of 1,000 seedlings per week.

Here is a provisional program, based on discussions with the IAM,IP nurseryman who works at the CONDOR Anacardium nursery:

10 Nov	17 Nov	24 Nov	01 Dec	08 Dec	15 Dec	22 Dec	05 Jan
800 grafted	800 grafted	1,000 grafted	1,000 grafted	1,000 grafted	1,000 grafted	1,000 grafted	1,000 grafted

After 7 weeks (45 days) the seedlings are available to be transported to the community:

12/Jan : 2,600 seedlings available	02/Feb : 3,000 seedlings	16/Feb : 2,000 seedlings

→ In this context, **we do not recommend planting with Condor Anacardium grafted seedlings (or at most 1,600 seedlings grafted before November 17 if PPF wishes to maintain the established collaboration).** But there are **other alternatives with the IAM, IP** to have more resistant seedlings and/or polyclonal seeds, located near the Park:

- **Polyclonal seedlings (more resistant) will be available at the end of November 2023 at the IAM,IP Chokwé Nursery** (4,000 polyclonal seedlings) **and the IAM,IP Mapai Nursery** (3,000 seedlings). The seedlings cost 20-25 MZN/unit.
  With the agreement signed between Condor Anacardium and the PeacePark Foundation, the fact that the IAM,IP is involved in the production of seedlings in Macia and has given the recommendation to use polyclonal seedlings (instead of grafted ones) to launch a structural cashew program around the Park, we believe that they could negotiate with the IAM,IP for seedlings free of charge, for this first year of implementation.
- **Polyclonal seeds:** 50 kg of seeds could be available in Mapai and Massingena at a price of 360 MZN/kg, starting in December 2023.

Regarding the need for seedlings and polyclonal seeds in this first year of implementation of the Cashew Program in the 6 targeted communities, the following tables summarize the information on the two (2) technical itineraries and the two (2) pilot trials:

IT or EXP	Beneficiary number		Number of polyclonal seedlings		
	Recommendations in part 7 of the report	Number	Recommendations in part 7 of the report	MIN.	MAX.
IT#1 Homemade cashew plantation	1/ CGRN members (10 members/6 CGRN) 2/ select families from the community including the H4H Program (10 families/6 CGRN)	**120**	05-20 seedlings / family	**600**	**2 400**
IT#2 Individual cashew orchard	1/ CGRN members (5 members/6 CGRN) 2/ select interested and motivated families from the community (3 families/6 CGRN)	**48**	Area of 0.50 ha maximum, either 50 seedlings (10x10 compass) or 40 seedlings (compass 12x12).	**1 920**	**2 400**
EXP#1: Cashew in the field (massiwé)	2-3 producers	**3**	Considering 1ha: 46 seedlings (15x15m) or 25 (20x20m)	75	138
	171 beneficiaries			**2 595 seedlings**	**4 938 seedlings**

Figure 19. Need for polyclonal seedlings

	Beneficiary number		Polyclonal seeds (1 kg = 80 seeds)
	Recommendations in part 7 of the report	Number	
EXP#2 Live hedges cashew and others	Mr. Xadreque (Tchai Tchai) who are part of the H4H Program	**1**	**5 kg of seeds**

Figure 20. Need for polyclonal seeds

→ In summary, **BNP would need for this first year of implementation**:

- **1st option:** between 2,595 and 4,938 polyclonal seedlings or **2nd option:** 1,600 Condor grafted seedlings (if PPF wishes to maintain the established collaboration) distributed on the west side of the BNP to facilitate logistics and between 995 - 3,338 polyclonal seedlings.
- **For EXP#2: maximum 5 kg of polyclonal seeds.**

The importance of coordinating with the Almond Institute (IAM,IP) of Gaza Province and the SDAE should be emphasized. As you can see from the maps (figures 16 and 17), IAM,IP agents are present in Mapai, Mabalane, Chokwé, Macia and Xai-Xai. The seedling and polyclonal seed nurseries are located in Mapai, Chokwé and Massangena.

IAM,IP contacts Gaza:

- Delegate Sergio Uique (IAM,IP Gaza Delegate): sergiouique@gmail.com
- Eng. Rogerio Langa (Head of the Almond Development Department at IAM, IP Gaza): rlangajr@gmail.com
- Dorcia Technician (IAM Chigubo) : 86.042.4748
- Technician Helder (SDAE Chigubo) : 87.300.8044

Transport contacts that SDAE/IAM uses to distribute seedlings: National Institute for Disaster Management (INGD): Mr. Zefanias: 86.12.24.631

→ **Other alternatives for the next planting campaign (2024-25):**

- Right sowing of polyclonal seeds (see **Annex 5**)
- Implementation of local nurseries with polyclonal seeds (**could be part of Nitidae's next missions**)

9. Monitoring & Evaluation (M&E) of cashew planting

Based on the reality of the working conditions of the Community Department team (limited means of movement and no GPS to geolocate the fields), NITIDAE recommends that the Community Department of BNP monitor the planting of cashew trees as follows:

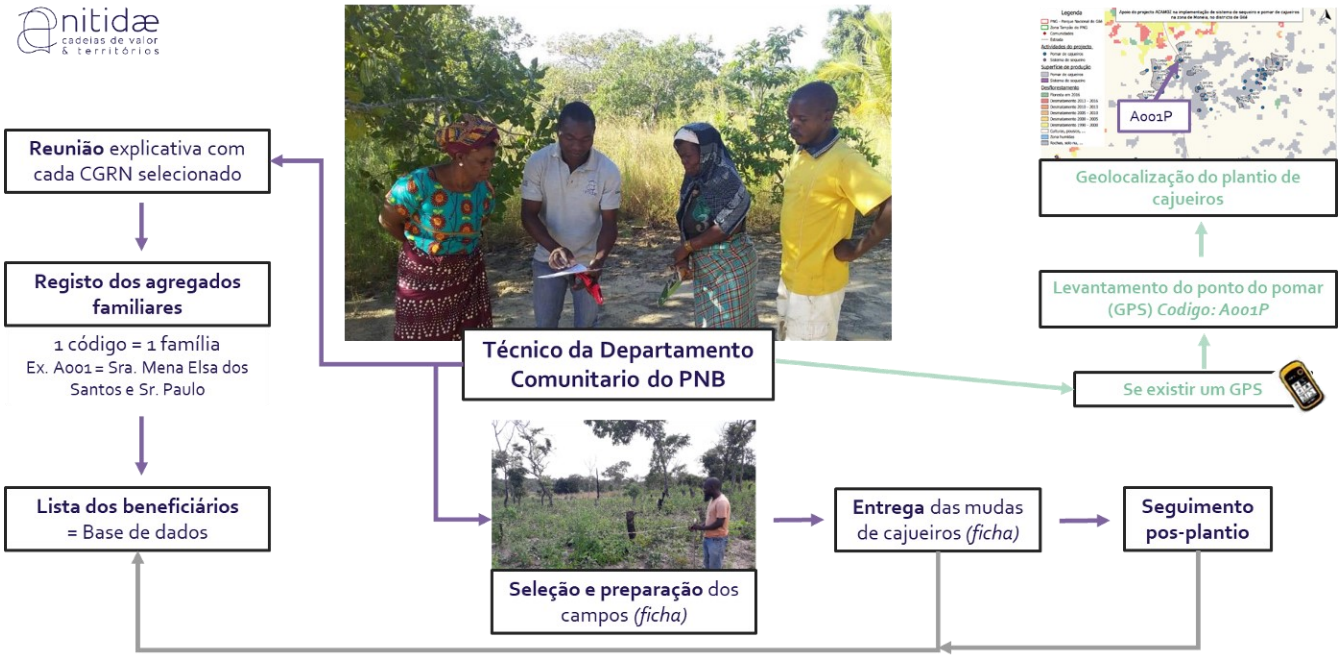

Figure 21. Proposed Monitoring & Evaluation system by the BNP Community Department

The document templates mentioned in figure 21 are as follows:

- Annex 6: Model form for preparing the field and delivering seedlings, which shows
  - *The name of the beneficiary and his/her spouse, linked to a single code: A001; A002, A003, …)*
  - *During field selection and preparation: fill in the "number of stakes" column*
  - *During the delivery of the seedlings: fill in the columns "date", "No. of seedlings received" and "signature" (if the beneficiary can sign)*
- Annex 7: Excel template for the list of beneficiaries (database) which includes all the data collected by the technician.

→ If there is a GPS and an interest in geolocating the fields, this training on using the GPS and processing the data in the GIS **could be part of the next Nitidae missions**).

10. Next steps

To be able to finalize the implementation plan, the missing activities are as follows:

Responsibility of the PPF/BNP:

- Choice of fields of interest: home planting, individual fields, ...
- Finalize the market access map with accessible planting zones
- Create a directory of contacts for business owners and producers
- Answer the comprehension questions in the agro-pastoral diagnosis available in Annex 3.

NITIDAE responsibility:

- Support for the seedling reception and distribution plan
- Follow-up of the work carried out by the Park Team and remote assistance.

ANNEX 1: NITIDAE program for the 1st mission to Banhine National Park

Time	Program	Responsible
Monday, November 13th, 2023 - Arrival		
6am - 6pm	Travel from Maputo to Banhine National Park Headquarters	Nitidae
	Sleeping in the Headquarters camp	
Tuesday, November 14, 2023 - Field trip		
8-10h	Meeting with the Community Department Team on: - farmers' practices and cashew interests/experiences, landscape dynamics, current community support activities implemented by the PPF; - the current situation and discussions with AICAJU about the supply of seedlings and future plans to buy chestnuts. - Nitidae's experience with Gilé National Park	Nitidae & PPF
10am-10.30pm	Presentation meeting with the BNP Administration	
10h30-17h	Visit to Tchai-Tchai, Tchove, Zinhane Meetings with the CGRN of Tchai Tchai and CGRN of Tchove	
	Sleeping in the Headquarters camp	
Wednesday, November 15, 2023 - Field trip		
5am-7pm	Visit to Saute, Mungaze, Hochane and Gerez Meetings with Mr. Francisco J. Manhiça (Saute), the CGRN of Hochane and the CGRN of Gerez	Nitidae & PPF
	Sleeping in the Headquarters camp	
Thursday, November 16, 2023 - Preparation & Debriefing with PNB		
AM	*Debriefing* preparation (internal work)	Nitidae
PM	*Debriefing* meeting with BNP staff *(including the Park Administrator, Head of Operations and Development, Protection Coordinator and Community Department staff)* for Nitidae to share its recommendations for defining the implementation plan and M&E system.	
	Sleeping in the Headquarters camp	
Friday, November 17, 2023 - Training 1 & Field trip		
AM	Technical Training #1: How to plant cashew trees properly to establish an agroforestry system that combines cashew trees and food crops?	Nitidae & PPF
PM	Field trip to Tchai Tchai (Mr. Xadreque)	
	Sleeping in the Headquarters camp	
Saturday, November 18, 2023 - Day of rest		
	Rest day	Nitidae
Sunday, November 19, 2023 - Tour of Maputo		
5h	Nitidae team leaves	Nitidae

Technical Training #2 on an overview of the cashew value chain and market was conducted informally during the conversations. It can be found in Annex 2.

ANNEX 2: Educational material on conservation agriculture

Educational material to raise awareness of conservation agriculture and the principle of legumes, mulch and living cover:

Guia material de sensibilizacao_VF.doc

Educational material to sensitize producers on improved conservation of beans and corn, with germ container and local repellents:

Caixa_conservação_s ecagem - Gile.pdf

ANNEX 3: Survey

A. SURVEY DATA	
A1. Inquiry No. _____	A2. Date (dd/mm/yyyy) : ____ / ____ / _____
A3. Name of interviewing technician	
A4. Locality and Neighborhood	

B. INTERVIEWEE & HOUSEHOLD DETAILS	
B1. Full name	
B2. Sex: Male ☐ Female ☐	B3. Age:

C. ANIMALS / LIVESTOCK					
C1. Do you have animals?	YES ☐ NO ☐				
C2. How many?	Goat	Chicken	Pork	Cattle	_____
C3. Are you part of the Healthy Cattle Program with the Park? YES ☐ NO ☐					

D. FIELDS & CROPS	Do you have this field?	Local name?	Main crops produced?
D1. Machambas seca?	YES ☐ NO ☐		
D2. Machamba on the riverbank/wetland?	YES ☐ NO ☐		
D3. Cashew orchard (like Mr. Francisco or Mr. Xadreque)	YES ☐ NO ☐		

E. PLANTS FOR LIVING HEDGES	
E1. Identify **thorny** plants:	Local name: Photo of the plant:
E2. Identify **euphorbias**:	Local name: Photo of the plant:

F. TREES OF INTEREST TO CATTLE	
F1. Identify **the native trees and plants that cattle use as** fodder.	Local name: Photo of the plant:

ANNEX 4: Terms of engagement between the cashew farming household and the ACAMOZ Project (template)

Supporting the cashew nut value chain without deforestation
around the Gilé National Reserve (2019-2021)

Terms of engagement between	
Community	
Neighborhood	
Name of Producer	
Spouse's name	
The household from the village _____, hereinafter referred to as "the household", AND the ACAMOZ project implemented by Nitidae, hereinafter referred to as "the Project", represented by its manager.	

The following should be noted in advance:

Article 1: Context and principles of collaboration

The project aims to promote a cashew nut value chain and sustainable agricultural production in order to :

- ✓ Achieve a sustainable increase in chestnut production and agricultural income by improving the living conditions of communities;
- ✓ To fight against the deforestation of the Miombo forest on the outskirts of the Gilé National Reserve;

The project promotes the following fundamental principles:

- ✓ Reducing deforestation: Producers must commit to prioritizing the development and investment in their orchards and fields that have already been opened, and apply the improved systems promoted by the Project to enable good soil fertility management. Producers must therefore reduce the opening of new forest fields and the use of unsustainable traditional slash-and-burn techniques. The project will only support identified existing farms.
- ✓ As part of their activities, producers must respect the legislation in force for the Gilé National Reserve and its buffer zone.
- ✓ Promoting the issue of gender: Producers must commit to promoting equal opportunities for men and women to participate and for women to lead in the activities carried out during the project; couples, both men and women, must attend the training sessions promoted by the project; women (and wives) must attend discussion meetings exclusively between women to discuss issues relating to agriculture and cashew; and in the case of surveys, both men and women will have their answers considered valid and representative of the farms.

Article 2: ACAMOZ project commitments :

On the basis of the producers' current practices and their objectives, the Project undertakes to support the producers in :

- ✓ Training and technical and economic support on agroforestry systems with cashew trees and good practices in integrated orchard management to improve cashew nut production and quality;
- ✓ Training and technical-economic advice for the association on management, business development, the cashew nut market and marketing (joint sales and information system on the market and its trends);
- ✓ Training and technical and economic support on conservation agriculture techniques to improve food crop yields and preserve soil fertility.
- ✓ Providing producers with the inputs, seedlings and material they need to learn the techniques and implement the improved systems and develop their activities;
- ✓ Maintain the discussion and regularly visit the producers' farms to help them resolve the difficulties encountered, evaluate the benefits of the techniques promoted by the project and continue learning.

Article 3: Household commitments

Households are responsible for the development of their orchards and fields. They are the "engine" of this performance and are solely responsible for marketing their products. The household must actively collaborate with the project and undertakes to:

- ✓ Work together with the project technician to develop the orchards in a spirit of collaboration;
- ✓ Reduce the opening of new forest fields and the use of unsustainable traditional slash-and-burn techniques. The project will not support newly opened fields.
- ✓ Use the inputs provided by the Project only in the orchards and fields identified together with the technician;
- ✓ Follow the technician's recommendations on the improved practices promoted by the project, such as the preservation of native species;
- ✓ Take care of the support received from the project, in particular the cleaning of the orchards, which must never be burnt;
- ✓ Attend the training sessions organized by the technician or the visits organized as part of the exchange of experience, and likewise accept any project visit organized in their own orchard;
- ✓ Provide the project technician with the socio-economic and technical data needed to assess the results and impacts of the project, as well as the level of adoption of the techniques promoted;
- ✓ Inform the project manager of any constraints on participation in the project.

Article 4: Duration of collaboration and conflict resolution

These terms of engagement are effective from the date this document is signed until the end of the project in December 2023. In the event of a conflict between the household and the project technician or if one party fails to comply with one of the obligations set out in this contract, Nitidae's management will mediate with a third party. If no solution is found, the collaboration will be terminated.

Signing of the terms of commitment:

Signature date: _____

The household (see table) The ACAMOZ project representative

Producer code	*Name of producer*	*H/M*	*Age*	*Name of spouse*	*Contact number*
Producer's signature	*Signature of spouse*	*Beneficiary MOZBIO*	*Service provider (x)*	*Number of orchards*	*Number of cashew trees*

ANNEX 5: Technical training #1 on demarcating fields and planting cashew trees

TREINAMENTO TÉCNICO #1:

COMO PLANTAR CAJUEIROS ADEQUADAMENTE AO REDOR DO PARQUE NACIONAL DE BANHINE (GAZA, MOZAMBIQUE)

1. Limpeza do terreno

A limpeza da área para implantação do pomar deve ser efectuada antes do plantio, removendo toda a vegetação indesejada.

2. Demarcação usando cordas e pau/estacas

a. Preparação do material antes de ir ao campo :

- O produtor prepara suas estacas/pau de máximo 1 metro de altura
- O Técnico prepara as cordas que vão servir pela demarcação. Para este efeito é necessário :
    - Uma (1) fita métrica;
    - Para um compasso de 10 m x 10 m: uma (1) corda de 45 m com nós de 10 em 10 metros.
    - Para um compasso de 12 m x 12 m: uma (1) corda de 55 m com nós de 12 em 12 metros.
    - Para um compasso de 15 m x 15 m: uma (1) corda de 65 m com nós de 15 em 15 metros.

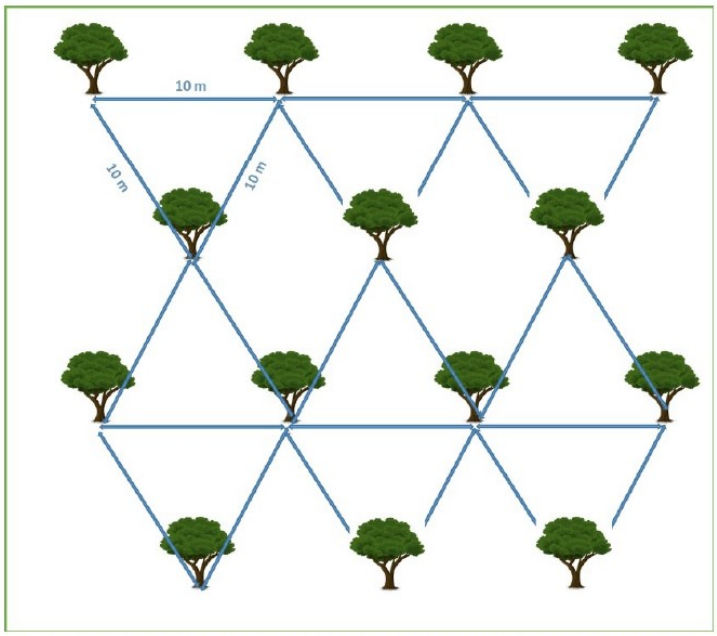

Figura 1. Exemplo de um pomar de cajueiros, em zigzag, com compasso de 10 x 10 metros

Na Figura 1, usamos o compasso de 10 x 10 metros. O esquema é applicavel para os outros compassos.

b. Demarcação do pomar, no campo determinado junto com o agregado familiar:

- É importante bem respeitar a **orientação da plantação Este – Oeste em zigzag** para minimizar a ocorrência de sombra nas linhas de cajueiros.
- Deve ser avaliado com o agregado familiar se é recomendável de guardar um espaço de 2-5 metros entre a limite do campo e a primeira linha de mudas para evitar conflitos com vizinhos ou sombra da margem da floresta.
- A partir do início de cada fileira marcada, por meio da utilização de cordas, marcar posições das covas até o término da linha, com uma estaca de 1 metro:

1. Iniciar a demarcação com a primeira linha, usando a corda: FIGURA 2

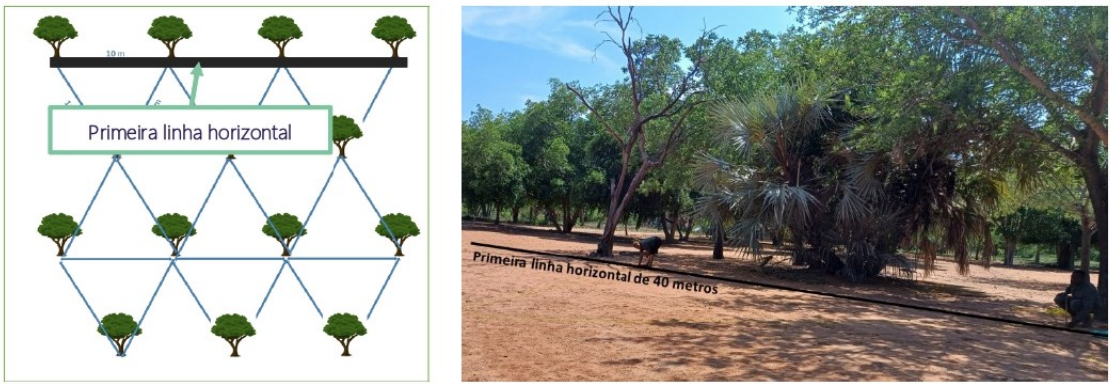

FIGURA 2. ETAPA 1 DA DEMARCAÇÃO

2. Com a demarcação da primeira linha, pode marcar a segunda linha e as seguintes: FIGURA 3

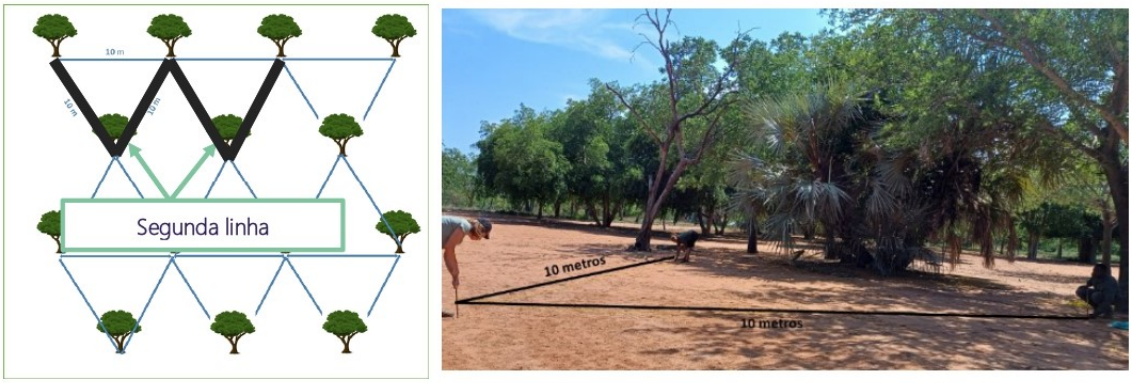

FIGURA 3. ETAPA 2 DA DEMARCAÇÃO

3. ABERTURA DAS COVAS:

- A abertura de covas deve assegurar o bom desenvolvimento do sistema radicular.
- As covas devem ter **dimensões duas palmas de mão pelo diâmetro e pela profundidade** (seja +/- 50 com, ver Figura 7).
- Durante a abertura da cova, o solo retirado deve ser separado de forma que a camada de cima (mais escura) seja colocada de um lado e a camada de baixo (mais clara) do outro lado (FIGURA 4).

FIGURA 4. ABERTURA DAS COVAS

3

4. Adubação:

- Logo apos a abertura das covas, **adubar as covas com matéria orgânica** (esterco de bovino bem curtido com o solo, por exemplo) e **palha curtida**.
- Deixar apodrecer durante mínimo duas (2) semanas, antes do plantio.

5. Plantio das mudas de cajueiros:

- O plantio de mudas deve ser efectuado no **momento do período chuvoso**.
- Ao colocar-se a planta na cova deve-se remover o saco plástico, prestando atenção para não destruir o torrão. O solo superficial, que tem mais materia organica (camada de cima) deve ser usado para o enchimento da cova e o solo retirado do fundo da cova (camada de baixo) deve ser usado na feitura da bacia à volta da muda, para a retenção de humidade (Figura 5).

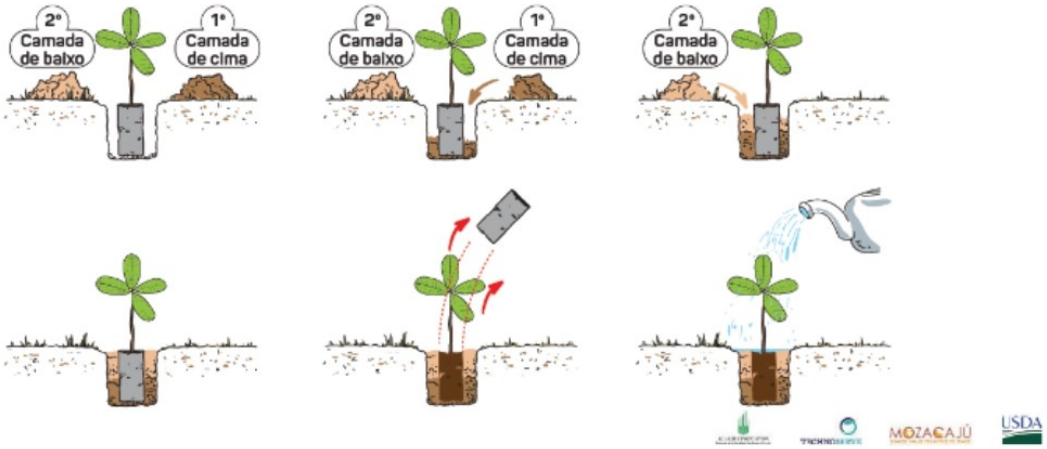

Figura 5. Plantio de uma muda de cajueiro

- Após o plantio deve-se **colocar capim seco ou restolhos na caldeira/bacia**, para diminuir a evaporação, auxiliando a conservação da humidade, manter uma temperatura amena e controlo físico de infestantes (Figura 6). Contudo, **cuidado que o capim seco ou restolhos nao estejam em quantidade grande e em contacto dieiro com a caule** da planta:
  - colocar uma pequena quantidade de capim, como illustrado na Figura 6 – para o capim não apodrecer;
  - deixar um espaço de 2 cm entre o caule e o capim - para o capim não afectar a planta.

Figura 6. Bacia e capim para manter a humidade do solo

- A estaca de 1 metro de comprimento deve colocar-se próximo à muda para servir de tutor e inspeccionar regularmente a ocorrência de muchém/térmites e outras pragas.
- **Pela rega**: garantir o fornecimento de água às mudas no período pós-plantio até ao estabelecimento pleno destas.

- **No caso das mudas enxertadas** : tirar a fita uma vez que a cicatrização for feita (se for deixar a fita, pode matar a planta), cortar os ramos ladrões para que cresça em altura.

6. Alternativa às mudas: Sementeira direita

A sementeira direita de castanha « nativa », pode levar a ter cajueiros com grande variabilidade genetica e por conseguinte com variabilidade na productividade. Para limitar este risco, existem **sementes policlonais**, que reduz esta variabilidade.

As etapas para uma sementeira direita de sementes policlonais são as seguintes:

a. Seleção de castanha de tamanho médio (não tão grande, não tão pequena)
b. Teste de fluctuação (Figura 7): separar as castanhas boas das castanhas más, mergulhando-as num recipiente com água salgada (1 kg de sal para 10 litros de água). Após 4 a 6 horas, retiram-se as castanhas que flutuam por serem de má qualidade e conservam-se as que ficaram no fundo do recipiente (sementes boas).

Figura 7. Teste de fluctuação

c. Imersão da semente: as castanhas do teste de flutuação são colocadas na água (esta vez sem sal), renovada de 6 em 6 horas, durante 24 horas, antes da sementeira. Esta operação ajuda a levantar a dormência das sementes.

Figura 8. Sementeira

d. Sementeira (Figura 8): Semear 3 castanhas diretamente no topo de cada buraco preenchido com terra, a uma profundidade de 6 a 10 cm, dispostos num triângulo equilátero de 10 cm de cada lado (equivalente da palma da mão).

A parte côncava da castanha aponta para baixo e o pedúnculo termina em ângulo.

e. Apos um ano, guardar o cajueiro mais vigoroso: o produtor retira as plantas, deixando apenas uma, a mais vigorosa, por cova. Não perturbar o sistema radicular do cajueiro conservado (Figura 9).

Figura 9. Manter o cajueiro mais vigoroso e tirar os outros

ANNEX 6: Model form for field preparation and seedling delivery

View EXCEL file

Comunidade: _____

CGRN: _____

Campanha 2023-2024

Ficha de preparação e de entrega das mudas de cajueiros

				Preparação do campo	Distribuição das mudas		
N.	**Codigo**	**Nome do beneficiário**	**Nome do conjugue**	**Nº de estacas**	**Data**	**Nº de mudas recebidas**	**Assinatura do produtor**
1	A001	Jonasse B. Munachere	Diamantina Vicente	15	15/01/2024	**15**	
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
			TOTAL:	**15**		**15**	

ANNEX 7: Excel file template with list of beneficiaries (database)

View EXCEL file

A	B	C	D	E	F	G	H	I	J
Codigo	Distrito	Localidade	Bairro	Nome completo do produtor	Nome do cônjuge	Membro do CGRN?	Faz parte do H4H?	Inicio - Nº cajueiros total (2023)	Adicionar outras colunas de base com o inquerito (Anexo 3)
H001	Gaza	Hochane	Hochane	Alberto Marchal	Joana Rodrigues	Membro CGRN Hochane	sim	5	I
H002	Gaza	Hochane	Hochane	Joao Raul	Elisa Menez	Presidente CGRN Hochane	não	0	I

K	L	M	N	O	P	Q	R
				30		27	
Itinerario(s) Técnico(s) escolhido(s)	Nr de estacas	Compasso	Data do plantio 2023-2024	Nr de mudas recebidas	Area (ha)	Nr de mudas vivas (6 meses depois plantio)	% de sobreviven
IT1: plantacao caseir	15	10x10	17/01/2024	15	0,19	12	80 %
IT1: plantacao caseir	5	10x10	17/01/2024	15	0,19	15	100 %