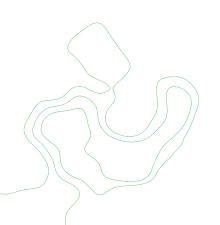
How to orientate agricultural development to decrease deforestation and improve small farmers' livelihoods.

> Nitidae's diagnostic methodology for the case study of the Gilé National Reserve in Mozambique

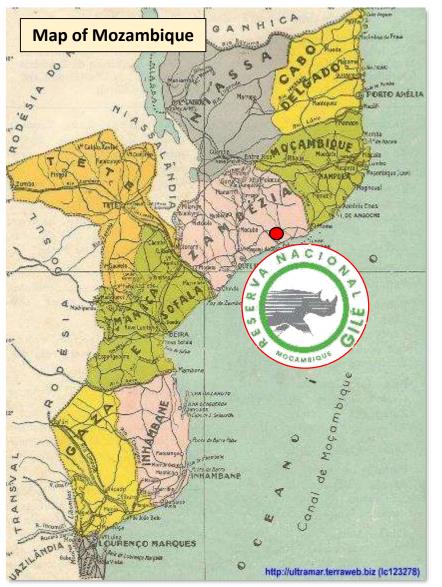
> > April 2021







Presentation of the Gilé National Reserve project

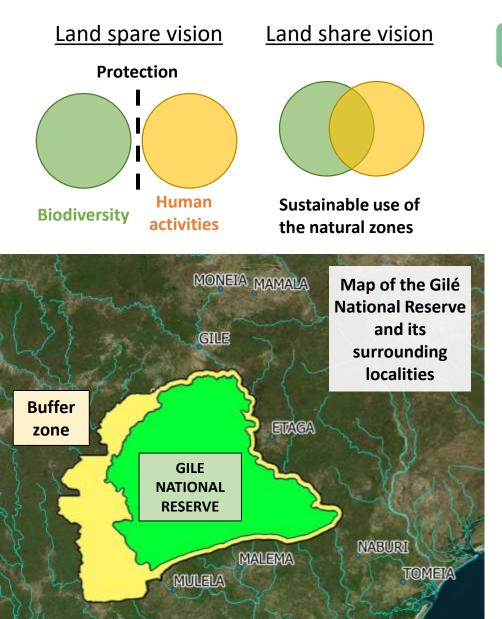


History of the Reserve

- Mozambique is heavily impacted by deforestation. In Zambézia, deforestation from 2000 to 2013 was estimated at 0,68%, reaching an <u>annual loss of 18'000ha</u>.
- The main cause of deforestation is itinerary agriculture, driven by the demographic increase in the rural areas.
- The Gilé National Reserve was created in 1932 for hunting / game. It covers 2'100km and is located in the East of the Zambézia province, near the coast.
- The Reserve fosters several protected species, a significant population of elephants among others. It was then granted the <u>conservation area status in 2000</u>.
- In May 2020, its status was upgraded to <u>National Park</u>.



Conservation VS development of the population



Importance of the buffer zone

- It is complicated to associate conservation of protected areas and development of the local populations
- \rightarrow Debate between the "land share" / "land spare"
- To improve the conservation efforts in the Reserve by associating communities, a <u>buffer zone</u> was created in 2011 around the core area.
- In this zone, some activities are allowed but controlled: farming, collect of NTFPs...
- Support is provided to improve subsistence practices and lower pressure on natural resources.
- This buffer zone allowed the creation of a <u>REDD+</u> <u>project</u> and several other projects followed with various NGOs involved, until today with the ACAMOZ project.

Supporting farmers so that they depend less on forest resources and can sustainably use them

Photo of the climate and type of vegetation in Gilé

Wet tropical climate

Dry savannah called Miombo

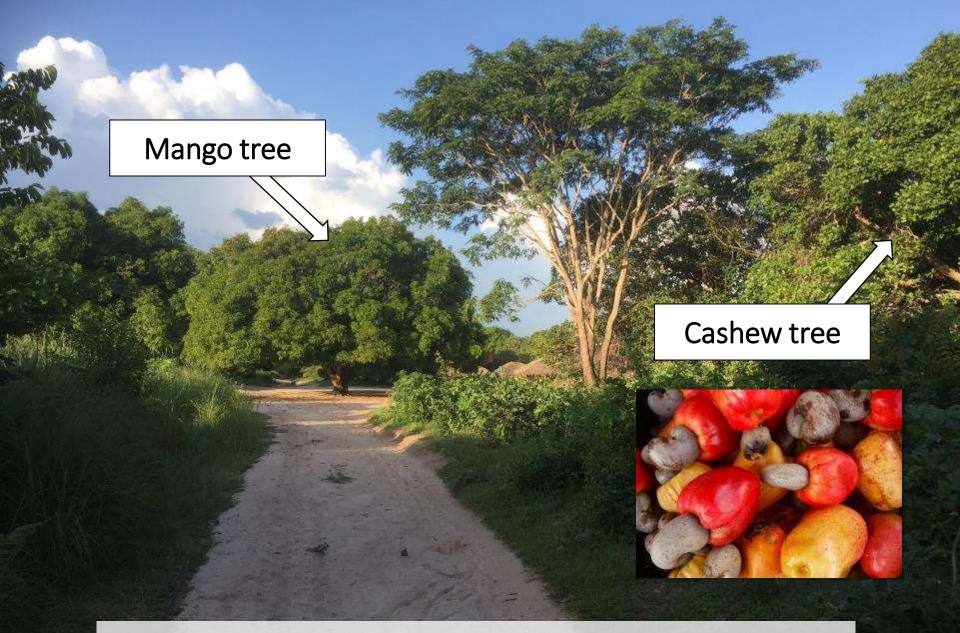
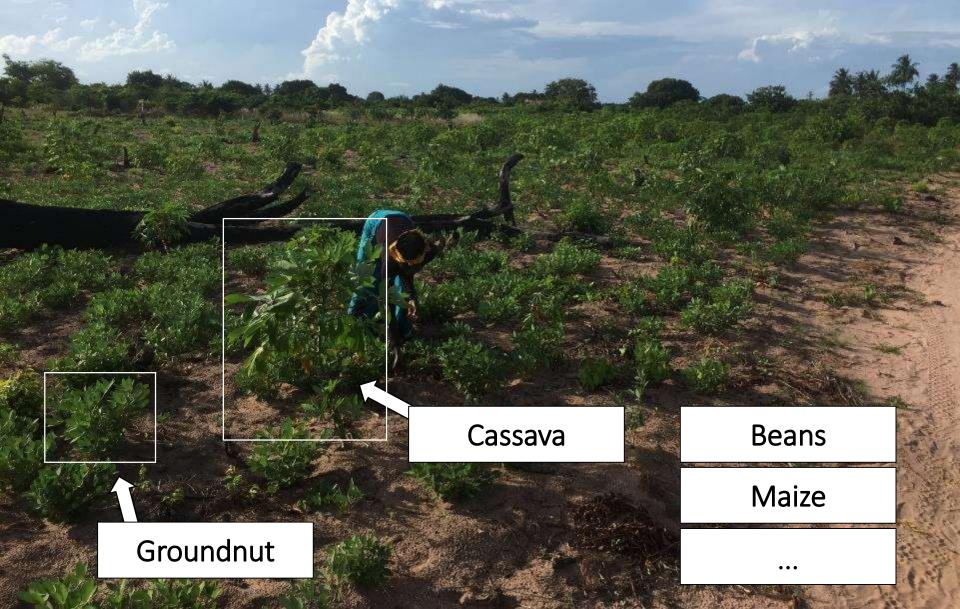


Photo of a locality close to the Gilé National Reserve

Photo of a typical farmer's plot in Gilé



ACAMOZ: cashew for livelihoods & preservation

Reinforce the value chain from top to bottom

- ACAMOZ relies on the principle that sustainable preservation is linked to less dependency of the surrounding communities on the forest resources.
- Since cashew nut has been an historical agricultural commodity for smallholders in this region, the project focuses on strengthening its **value chain**.
- Nitidae works in close relationship with the Mozambican cashew institute (INCAJU) to achieve various results:
 - Advise institutions on strategic management of the value chain
 - Deploy a market information system
 - Give recommendations to the industrial sector
 - Technical assistance to the producers around Gilé National Reserve





How to design a relevant and impactful technical assistance program and bring long-term changes to the farmers practices ?

A methodology is needed to assess the current situation of the farmers and perceive their reality and needs

Agrarian diagnosis concept

Perceiving the dynamics of a rural area

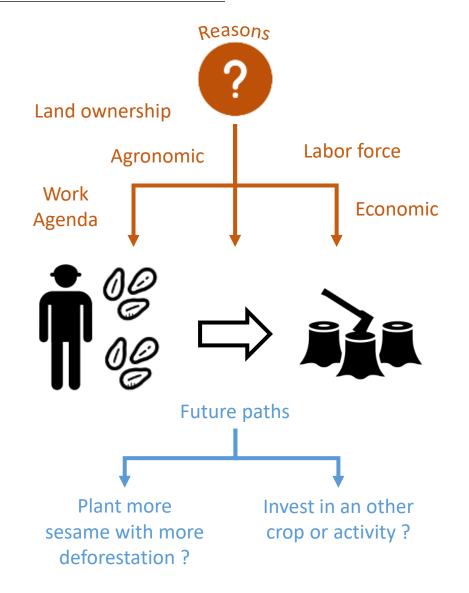
• The agrarian diagnosis is based on the comparative agriculture science:

"the science of transformations and adaptations in the agricultural development process" H. Cochet

• The aim is to understand past causes that led to current agricultural systems and anticipate how they will evolve in the future to:

"orientate the agricultural development in a way that is closer to the general interest" H. Cochet

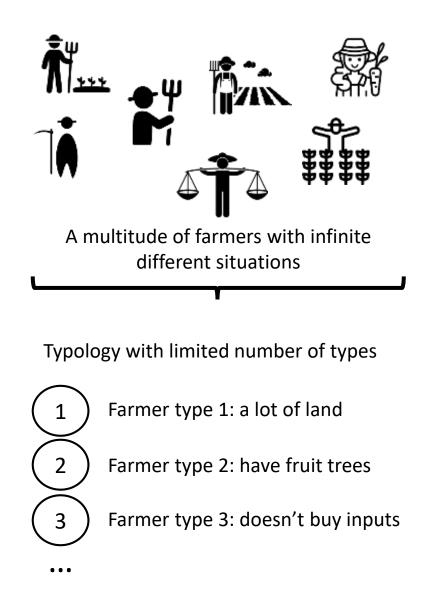
- The method to achieve this goal is to <u>observe</u> <u>and interview</u> farmers in order to deeply understand their strategy and limitations.
- Farmers have always good reasons to do what they are doing. <u>These reasons are not</u> <u>only limited to agronomic conditions</u>.
- That's why the agrarian diagnosis is a multidisciplinary and systemic tool.



Agrarian diagnosis concept

Building a typology of agricultural systems

- The objective of the agrarian diagnosis is to understand what's going on but <u>also to</u> <u>organize the information</u> in a way that is easy to explain to other people.
- It is very difficult since the reality of a rural area can be extremely complex.
- To make it understandable, you have to model it by building a typology of farmers that will allow to classify each farmer in a specific archetype reflecting its strategy.
- Each archetype is a model, it cannot be 100% accurate for all the farmers. But it is essential to <u>deal with the complexity</u> and perceive the main trends.
- The typology must be very well conceived on key criteria since it will be the cornerstone of the agrarian diagnosis.

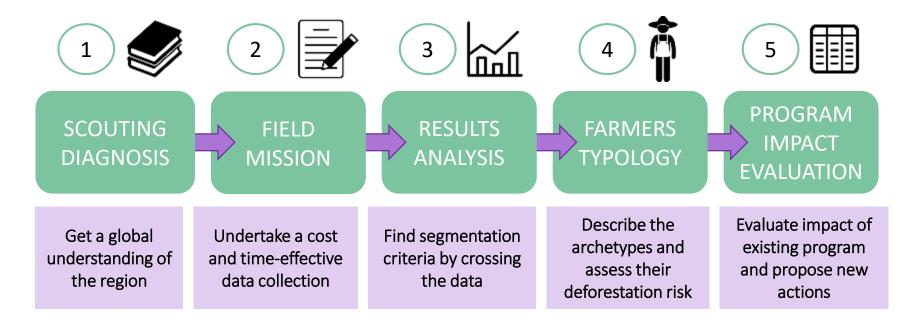


Nitidae's methodology in 5 steps

• Nitidae uses the Agrarian diagnosis as a tool to answer the issue:

"How to orientate agricultural development to decrease deforestation and improve small farmers' livelihoods ?"

- To do so, we adapt and complete the Agrarian diagnosis methodology so that:
 - It is applicable to a larger and more complex scale (zones around forest reserves)
 - It can be used in the most practical way and delivers results for our projects such as ACAMOZ





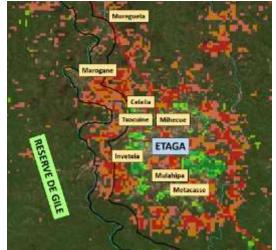
Scouting diagnosis

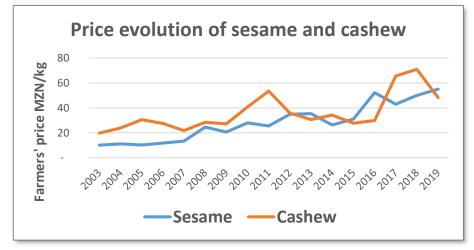
Get a global understanding of the region

<u>Tools</u>

- Thematic bibliography (socio, agro, eco...)
- Tele detection
- Value chain analysis







- Overview of the change of land use in past years (deforestation...)
- Analyze market evolution of the local agricultural commodities
- Understand the major factors that led to recent trends (migrations, conflicts, big pools of jobs...)



Field mission

Undertake a cost and time-effective data collection

<u>Tools</u>

- Survey
- Qualitative interviews





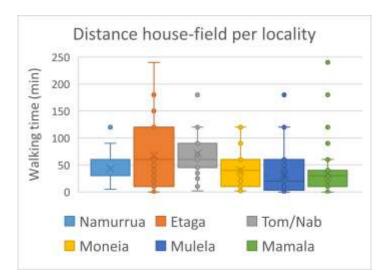
- Think the sampling method to obtain the most diversity possible with limited samples
- → For the Gilé project, 6 technicians made 230 surveys in 2 weeks, and 3 focus groups interviewed

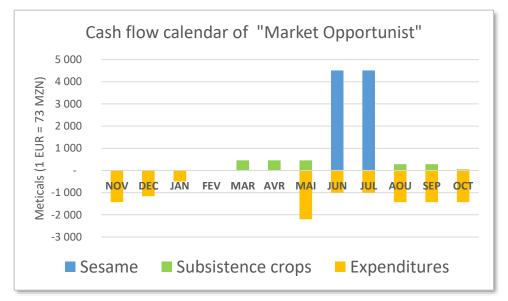


Find segmentation criteria by crossing the data

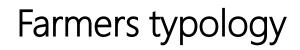
<u>Tools</u>

- Rate of subsistence/sale
- Cash flow calendars
- Agricultural practices
- Land repartition...



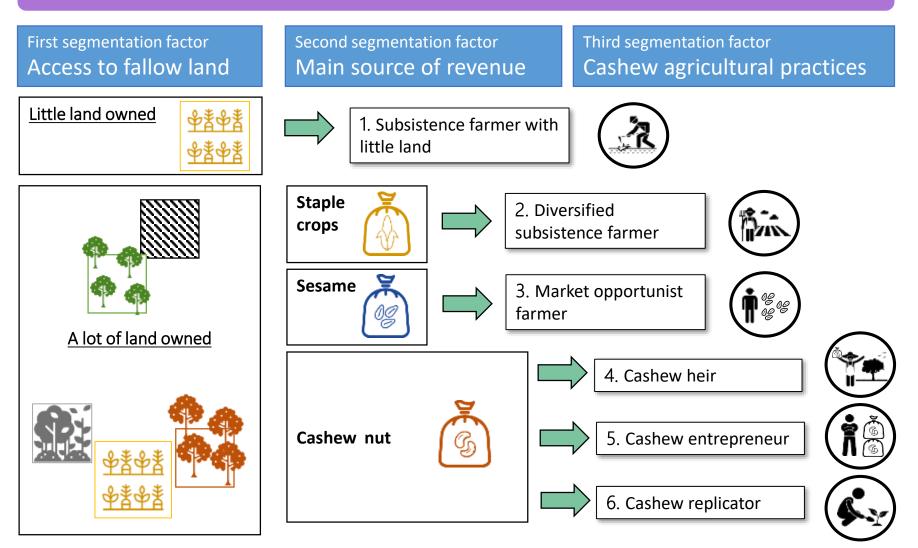


- Cross a maximum of variables between them (family number, areas, yields...)
- Find differentiation criteria
- Set intervals and thresholds to determine easily the type of each farmer surveyed



4

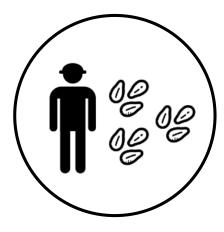
Describe the farmers' types, and detail their differentiation criteria







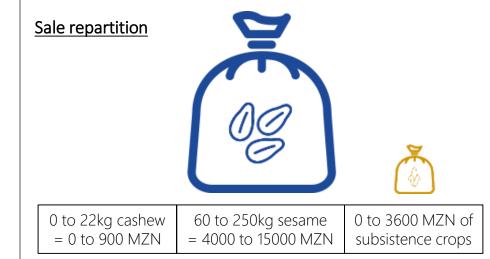
3. Market opportunist farmer



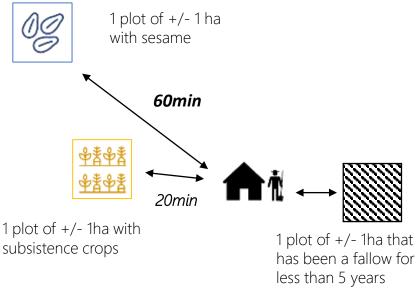
This farmer takes advantage of the current profitable agricultural commodity which is sesame.

However he needs to walk a higher distance to arrive to his sesame plots.

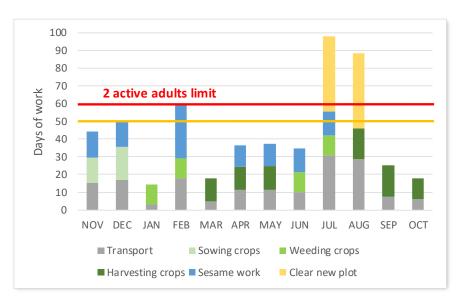
This type of farmer is mainly found in Etaga.

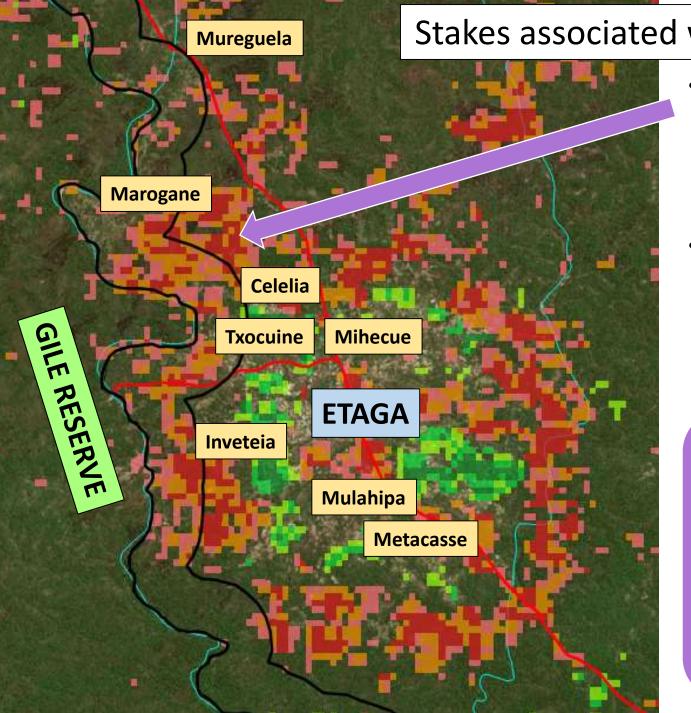


Field operations agenda



Land repartition





- Stakes associated with type 3.
 - Sesame is an exigent crop that needs specific soil conditions to be profitable
 - Market opportunist farmers expand their sesame plots ever closer to the Reserve

Sesame as a driver for deforestation ?

 \rightarrow How to alter this dynamic and reduce deforestation without negatively impact livelihoods?

6. Cashew replicator

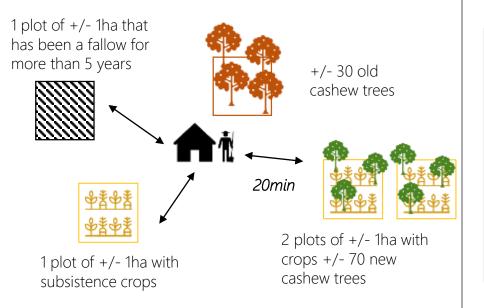


This farmer owns cashew trees and wants to replicate the success of the "Cashew entrepreneur". He expands its plantations by planting new cashew trees.

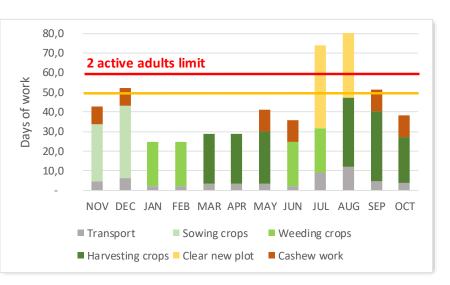
The major part of his cashew trees are still young and didn't reach their full productivity potential.

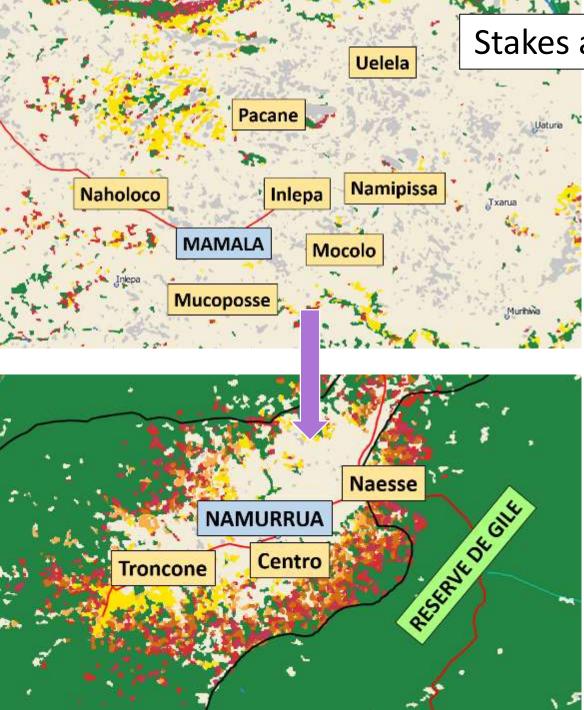


Land repartition



Field operations agenda





Stakes associated with type 6.

- Mamala: large locality that developed thanks to cashew.
- Little forest left because of past deforestation.

Same dynamic for Namurrua, a small locality close to the reserve with much forest left.

Cashew as a driver for deforestation ?

→ How to foster the cashew value chain without increasing deforestation ?



Assess the current risks of deforestation and poverty inherent to each type.

Types of farmers	Current risk of deforestation		Current risk of poverty
1. Subsistence farmer with little land	High		High
2. Diversified subsistence farmer	Medium		Medium
3. Market opportunist farmer			
4. Cashew heir	Low		Medium
5. Cashew entrepreneur	Medium		Low
6. Cashew replicator			
Try to fill the			
remaining cases If the risk is high, it mea the farmer will probably clear new land to plant	have to farm new plots. expe	If the risk is high, it means that the farmer can have less money, or experience scarcity of land and/or time to cultivate his subsistence crops.	



Assess the current risks of deforestation and poverty inherent to each type.

Types of farmers	Current risk of deforestation	Current risk of poverty	
1. Subsistence farmer with little land	High	High	
2. Diversified subsistence farmer	Medium	Medium	
3. Market opportunist farmer	High	Medium	
4. Cashew heir	Low	Medium	
5. Cashew entrepreneur	Medium	Low	
6. Cashew replicator	High	High	



Next step is to find corresponding project measures to mitigate these risks and then evaluate their impact.



- Evaluate the impact of assistance measures on each farmer's type risk, and its rate of adoption.
- Identify obstacles and give recommendations to improve the program.

SUPPORT TO DIVERSIFICATION (fruits & vegetables)			getables)	Obstacle	Decommondation
Type of farmer	Adoption	Deforest.	Poverty	Obstacle	Recommendation
1. Subsistence farmer with little land	High	0	\checkmark		
2. Diversified subsistence farmer	High	0	\checkmark		
3. Market opportunist farmer	Low	0	↑	Competition of labor with sesame	Propose associations with sesame or not relevant
4. Cashew heir	High	0	\checkmark		
5. Cashew entrepreneur	Medium	0	\checkmark	More interested by cashew	
6. Cashew replicator	Medium	0	\checkmark	Competition of labor with cashew	Not relevant



Program impact evaluation

Try to assess the adoption and impact of the measure "Distribution of cashew tree seedlings" on the farmers' types 3 and 6.

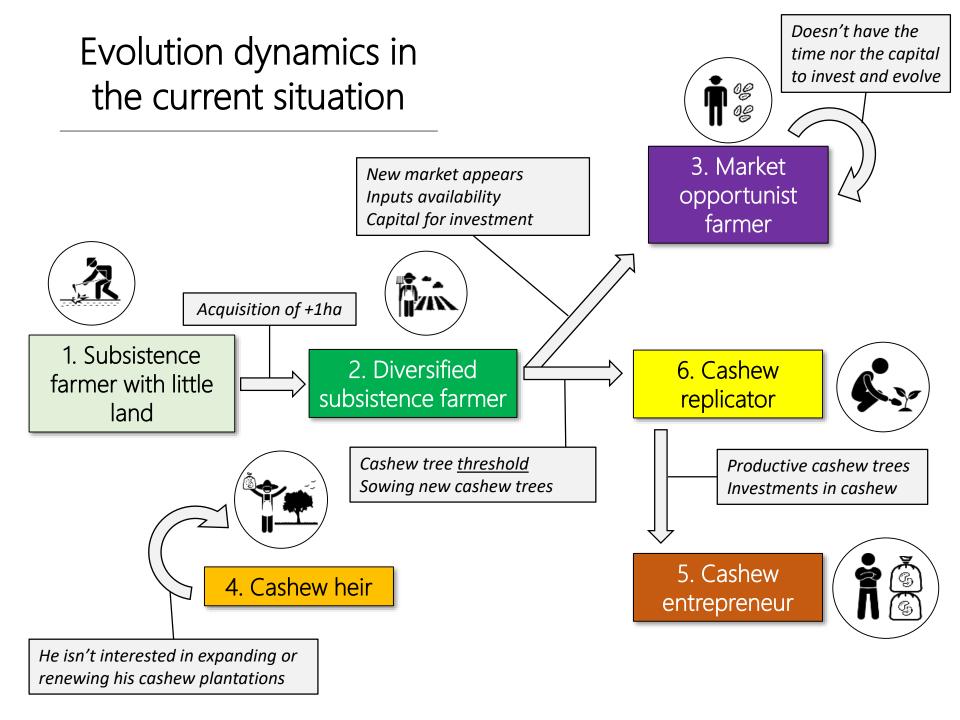
DISTRIBUTION OF CASHEW TREE SEEDLINGS			LINGS	Obstacle	Decommondation
Type of farmer	Adoption	Deforest.	Poverty	Obstacle	Recommendation
1. Subsistence farmer with little land					
2. Diversified subsistence farmer					
3. Market opportunist farmer					
4. Cashew heir					
5. Cashew entrepreneur					
6. Cashew replicator					

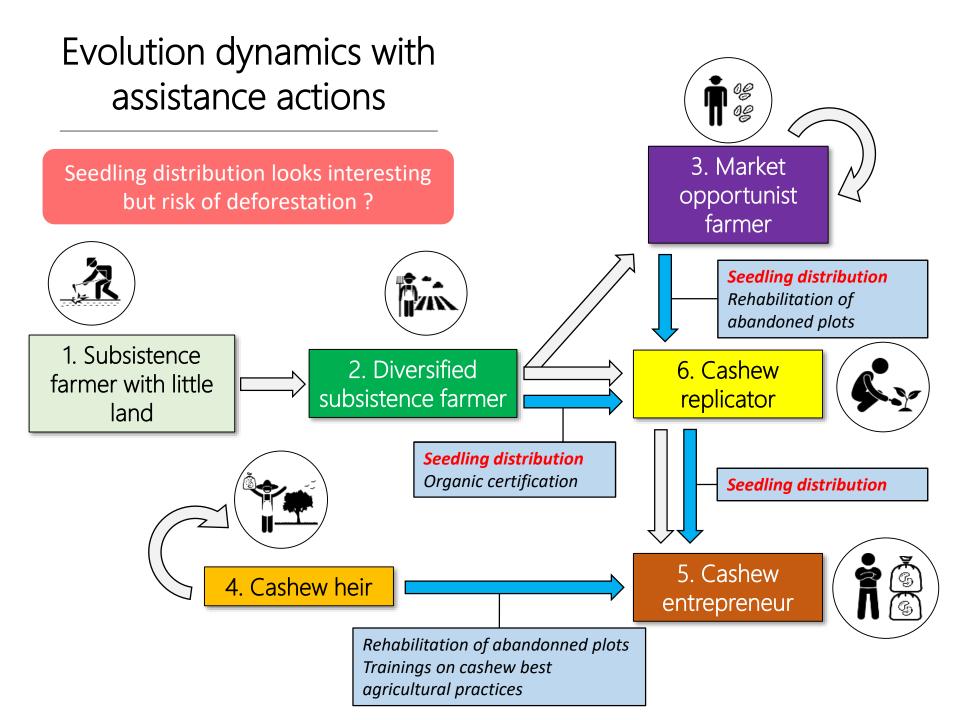


Program impact evaluation

Try to assess the adoption and impact of the measure "Distribution of cashew tree seedlings" on the farmers' types 3 and 6.

DISTRIBUTION OF CASHEW TREE SEEDLINGS			LINGS	Obstacle	Recommendation
Type of farmer	Adoption	Deforest.	Poverty	Obstacle	Recommendation
1. Subsistence farmer with little land					
2. Diversified subsistence farmer					
3. Market opportunist farmer	MEDIUM	+	+/-	Competition of land and labour with sesame	Propose support for agroforestry systems cashew/sesame
4. Cashew heir					
5. Cashew entrepreneur					
6. Cashew replicator	HIGH	+/-	+/-	Competition of land with subsistence crops	Propose support for agroforestry systems cashew/subsistence





For more information:

<u>Full diagnostic in Mount Gilé, Mozambique (French)</u> <u>Diagnostic in Mount Namuli, Mozambique (English)</u> <u>Agrarian diagnosis in Anosy region, Madagascar, (French)</u>

