

# **DEVELOPMENT OF A BUSINESS MODEL AND A COMERCIAL PROTOTYPE USING THE EXCEDENT OF FRUIT IN BOA VISTA DO ACARÁ – PA, BRAZIL**

## **ABSTRACT**

In the two week encounter the group worked with an association of organic farmers (called APOBV) in a community close Belém to design different uses for excess fruit. It was a co-creation process with the community and the design-thinking methodology was essential. After one week of investigation, the group decided to make one viable sub-product of the fruit including appealing branding and packaging and a business plan for this business. The project was influenced by the permaculture principles and the regenerative capitalism mindset.

## **1. INTRODUCTION**

### **1. Background**

Boa Vista is one of the communities of Acará, a municipality of Pará (state in northern Brazil). Boa Vista is about 40 minutes away from Belém, the capital of Pará and is surrounded by the Amazonian Rainforest.

Inside Boa Vista exists APOBV, the Association of Organic Producers of Boa Vista. This association was formed in 2003 and now counts 28 associates. Its current main goal is to increase the range of income for the community.

### **2. Community Description**

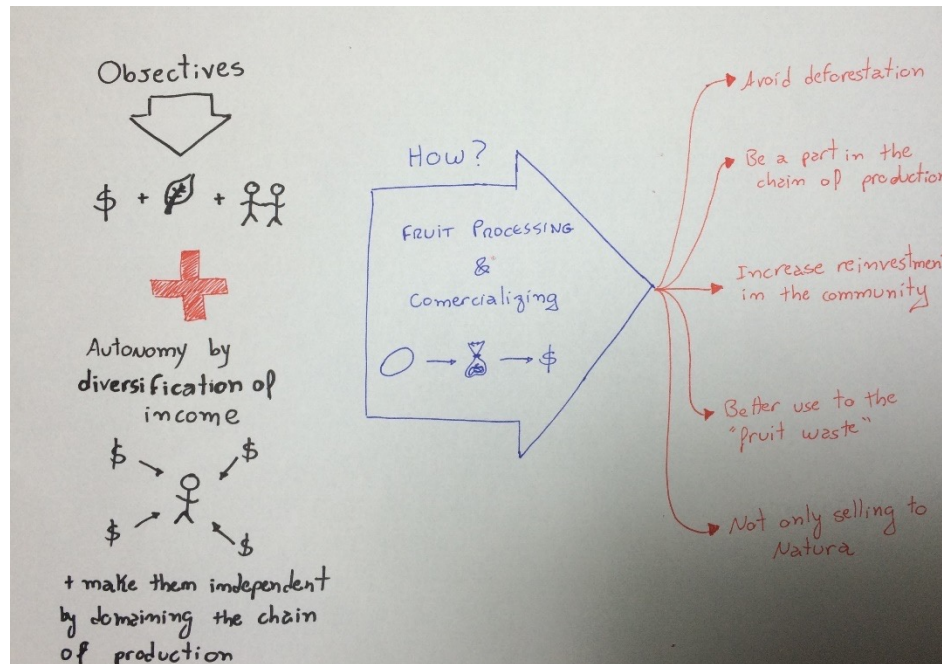
Boa Vista do Acará is a community that has a myriad of natural resources, including a wide range of fruits as well as different plants used for the production of cosmetic products. However, the commercial use of these resources is limited, because of the low selling price of raw produce. Moreover, APOBV has little economic autonomy because Natura, a Brazilian manufacturer and marketer of beauty products, is their main source of income since it is the main buyer of pirioca, the only product of APOBV.

While the farming of pirioca is the sole economic activity of APOBV, its members engage in various other economic activities such as the production of manioc and various manioc products, small-scale poultry farming and production and limited processing of various fruits. Nowadays, fruit is pulped and sold individually by each producer in small quantities. A considerable amount of pulp is also reserved for personal consumption. However, the community is not able to absorb (to consume or sell) the largest part of the natural production of fruits. Also, solely the pulp of the fruits is used. In both the leftover fruit as well as waste products such as seeds and shells lies potential for additional income generation.

### **3. Goal Statement**

We aim to explore means to generate additional income for the members of APOBV using the abundance of fruit present in Boa Vista do Acará. This income will a) create some level of independence of APOBV from the income obtained from the relationship with Natura and b) create funds that allow the association to invest into their need for education, as identified by another team. Further investment ideas include a health- and retirement fund, reforestation and the purchasing and protection of forest land. The activities associated with this business will allow APOBV to create closer social bonds with non-associated community members. We aim to create this additional income by developing a business plan to aid the growth of existing economic activities with pulp of various fruits, as well as developing valuable high-margin products from several fruits.

Bellow in **picture 1** there is a scheme of the objectives of the project



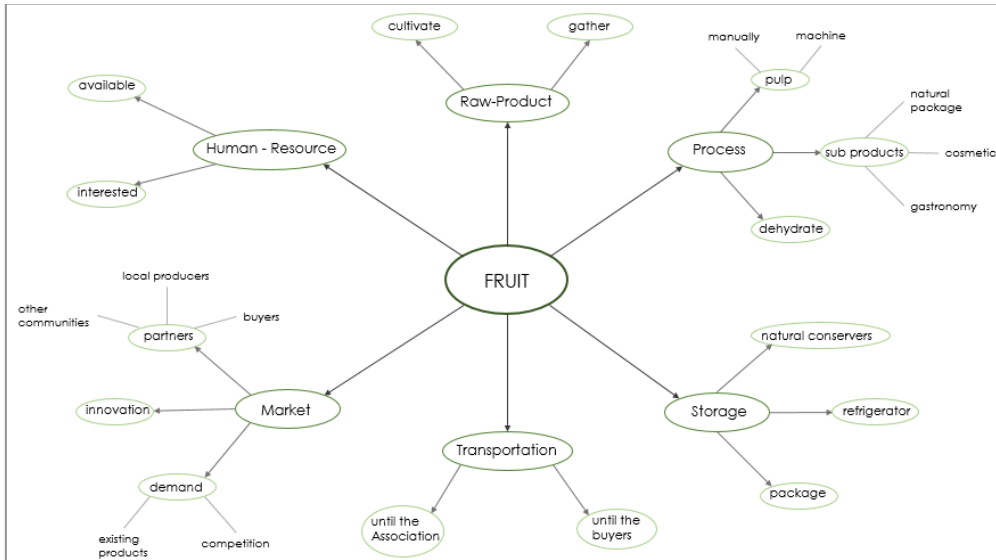
PICTURE 1 – First draw of the objectives of the fruit project

## 2. DESIGN PROCESS

### 2.1 Project Framing Tree

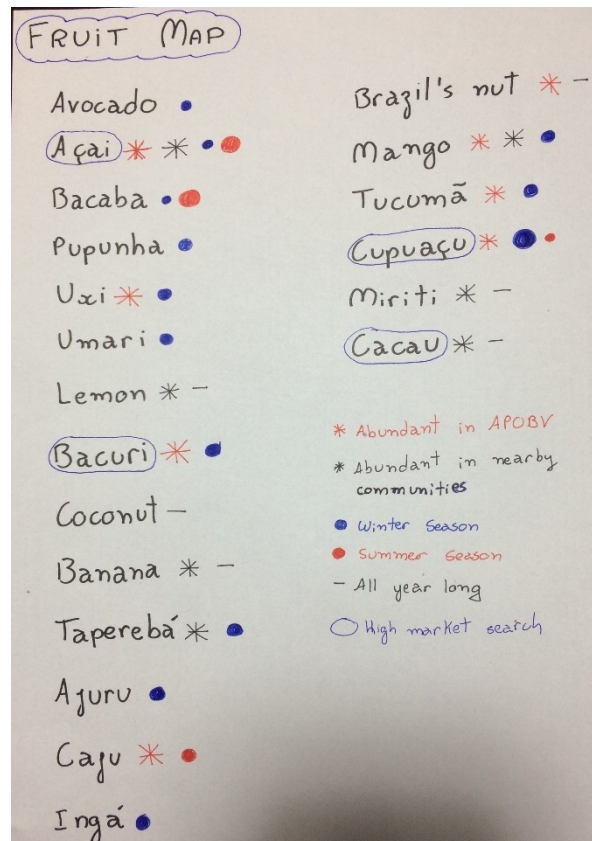
The Association had previously expressed the wish for a multi-fruit de-pulping machine. It was their assumption that the machine would enable them to absorb all the fruit production and go into contract with a larger customer.

However, the group started the project with the more general question of how to generate additional income using fruit and fruit by-products, to verify the assumptions related to the de-pulping machine and develop other potential avenues for income generation. The group tried to map all aspects related to the productions and use of fruit. Taking a holistic view the group could verify with the association members a general view of the parts involved with the fruit business. The holistic map is illustrated in **picture 2** below.



**PICTURE 2 – Holistic Map of the production and use of the fruit**

In order to understand the potential of fruit business in Boa Vista and help the team focus on one or several specific crops, a list of the main fruits was made, including their availability year-round. This list is illustrated below in **picture 3**.



**PICTURE 3** – List according to the production inside and outside the Association.

## 2.2 Value Proposition

Within this context, the project aims to diminish the current economic dependency of APOBV on Natura and the production of pirioca by realising the economic opportunities presented by the abundance of fruit present in Boa Vista do Acará. This includes the processing of fruit into pulp and other sub-products made out of the pulp, shell and seeds of the fruit such as jams, packaging and chocolate.

The market price of the fruit is rather low because the fruit is a raw material that is relatively abundant in the region. Processing the fruit adds value to the product, increases storability and the product range. Several possible sub-products can be produced and sold all year long contrary to the raw fruit that is spoiling fast. Therefore, in order to obtain a viable income for the Association, the project had to consider many factors such as market competition, production capacity and labor force availability.

Market prices show that processing the fruit more than doubles the value of the raw fruit. The **table 1** below gives an idea of the profit margin regarding the raw fruit and the more processed products.

**TABLE 1** – Comparison table with the market prices (in the local currency reais)

Fruit	Fruit Price (kg)	Pulp price (kg)	Subproduct	Subproduct Price (kg)
Cupuaçu	R\$ 4.50	R\$ 12.00	Cupulate (seeds)	R\$ 100.00
			Nibs (seeds)	R\$ 130.00
			Brigadeiro (seeds)	R\$ 140.00
Bacuri	R\$ 15.00	R\$ 40.00	Sweet of Bacuri (shell)	-

<b>Manga</b>	R\$	5.00	R\$	9.00	-	-
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of the main fruits and its sub-products.

The data represents an average of the prices given by local producers and Agricultural Cooperatives.

The exchange of knowledge over the fruit processing and the reinvestment of the profit made on local producers and workers are examples of immediate regenerative effects of the fruit business.

## **2.3 Summary of Design Process**

The design process was divided into 3 phases.

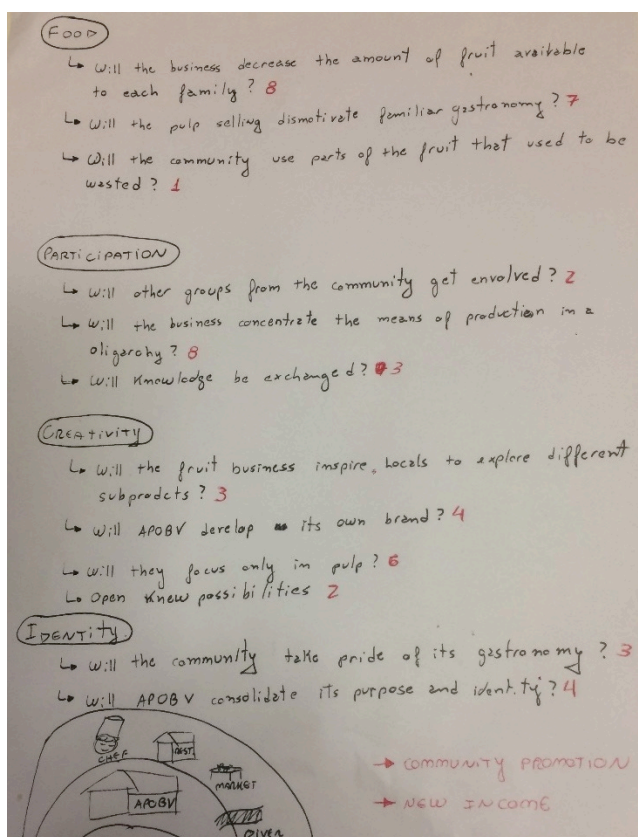
### **2.3.1 First phase – understanding needs and articulation of objectives**

#### **2.3.1.1 needs inventory**

The needs inventory was made in order to have a better understanding of the stakeholders and the context. The goal is to address the human needs of the stakeholders, and the needs are more than money. The focus was the Boa Vista Community.

To do the needs inventory, the group first looked at the Basic Human Needs made by Max-Neef and then selected the topics that hold the biggest relationship with the project. After this selection of topics, more specific questions/statements were made to each topic. The evaluation of each statement was quantitative in a scale of 0 (very good to the community life) up to 10 (disturbed the community life). After an overview of the questions the group wrote in red the biggest opportunities of the project. A rough diagram of the stakeholders was made. The needs inventory guided the group throughout the project development.

The board that the group worked on is shown in **picture 4** below:



**PICTURE 4** – Needs Inventory focused on the human needs of the Boa Vista’s community.

### 2.3.1.2 attempted map

The group started mapping the Boa Vista area in order to understand where the main fruit trees were. While doing this process, team member Sir Paulo, a member of the association, recalled that they had already done a similar map.

The association map represented the area surrounding the houses of the associates. However, the number and type of trees were not accurately represented. Two main reasons made the accurate representation of fruit trees difficult: The Boa Vista community does not have a fruit plantation; the trees are randomly distributed in each area. The second reason is that after the fruit consumption, locals throw the seed on the soil and some of these seed

germinate. This way, the existence of fruit trees is a much more dynamic system than we expected. The project was then adapted to this dynamic, non-cultivation environment.

### 2.3.2.3 patterns

The group first started to understand some patterns regarding the fruit use among the community. Three main patterns were identified:

- 1) The community members gathered fruit during its production season, usually during the 4 months of winter time (December to March). They pulp the fruit independently. A part of the fruit they keep to use all year long.
- 2) Only a few of the community members sells the fruit and the pulp on markets in Belém. Even less members of the community buy fruit from other local producers to sell on markets in Belém on a slightly larger scale. The rest of the fruit was left on the grounds of Boa Vista. They could not absorb the total amount of fruit available.
- 3) Both women and men were interested in producing culinary products but only few engage in production for selling.

### 2.3.1.3 stakeholder analysis & discussion

To accomplish this phase, a stakeholder analysis was essential. Information was added as the project developed. The direction of the project was greatly influenced by some of these stakeholders.

Some important information was obtained with the stakeholders. The highlights are organized below in **table 2**.

**TABLE 2** – Rough mapping of all the stakeholders including the information given by them

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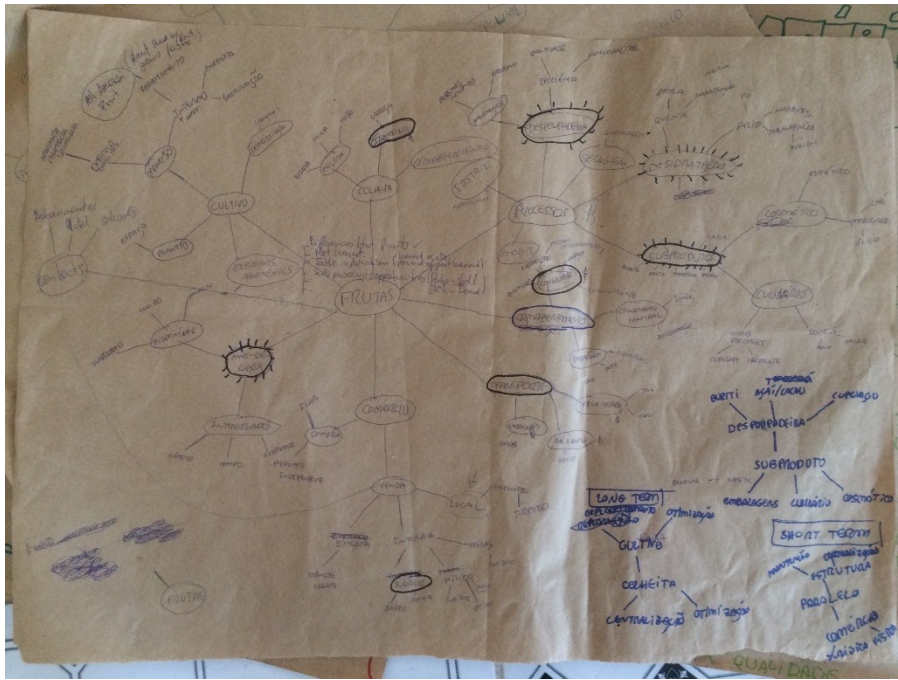


<b>President of the APOBV</b>	<b>Fruit Producer - associate</b>	<b>Fruit Seller - associate</b>
<ul style="list-style-type: none"> <li>. Tried to sell fruit but did not have enough production to get a big buyer</li> <li>. The average salary for a day of work at APOBV (R\$ 40.00)</li> <li>. APOBV had only one freezer</li> </ul>	<ul style="list-style-type: none"> <li>. There was at least 25 associates that had production similar to his production</li> <li>. From his statement it was made an estimate of the production capacity within APOBV</li> </ul>	<ul style="list-style-type: none"> <li>. Sold the fruit at the organic fair</li> <li>. Other producers gave up selling because of the expansive transportation</li> <li>. His fruit was requested for the quality of the pulp (hand pulped)</li> </ul>
<b>Food Processor</b>	<b>Food Technician</b>	<b>Fruit Producer/Seller – non associate</b>
<ul style="list-style-type: none"> <li>. Average time for pulping 1kg of fruit (about 25 min)</li> <li>. There was not enough incentive to make a different product other than pulp</li> <li>. Enjoyed cooking</li> </ul>	<ul style="list-style-type: none"> <li>. Big range of possible food products using the shell, the seeds and the pulp of the fruits</li> <li>. Highlighted the cupulate (chocolate made out of the cupuacu's seeds) and the Bacuri jam made out of the shell of the bacuri fruit</li> </ul>	<ul style="list-style-type: none"> <li>. Only worked with the pulp of tree fruits (cupuaçu, bacuri and uxi)</li> <li>. He was not able to sell all of the production due to the lack of storage infrastructure</li> <li>. Bought from other local producers</li> <li>. Only 6 others like him</li> </ul>

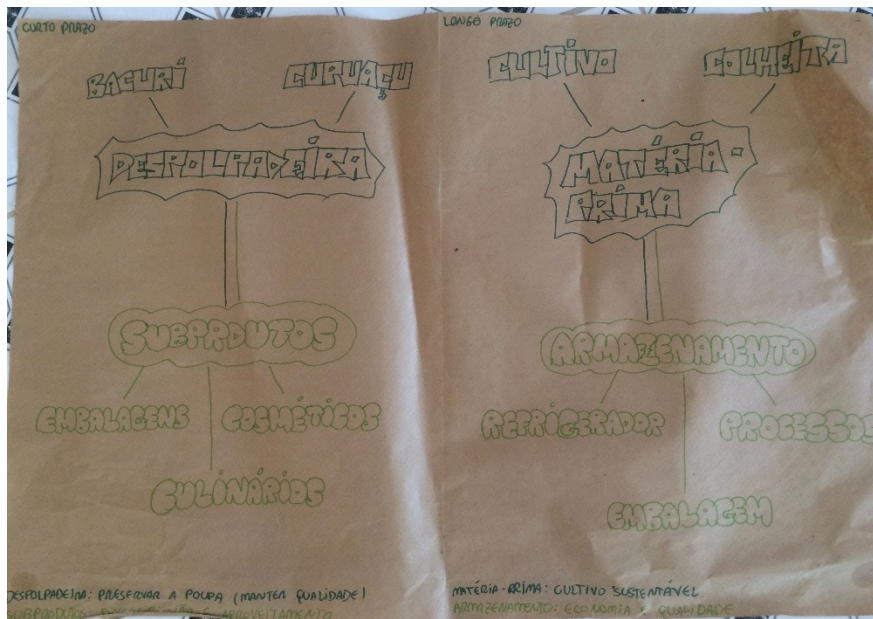
## **2.3.2 Second phase – information gathering & synthesis/analysis of the local**

### **2.3.2.1 concept maps**

Throughout the project many concept maps were in order to organize the ideas and the process. A concept map starts with a main concept and then arrows and other relevant concepts are added. The holistic map shown in topic 2.1 was one of the first concept maps drawn by the group. Below there are some of the many concepts maps that were made during the project.



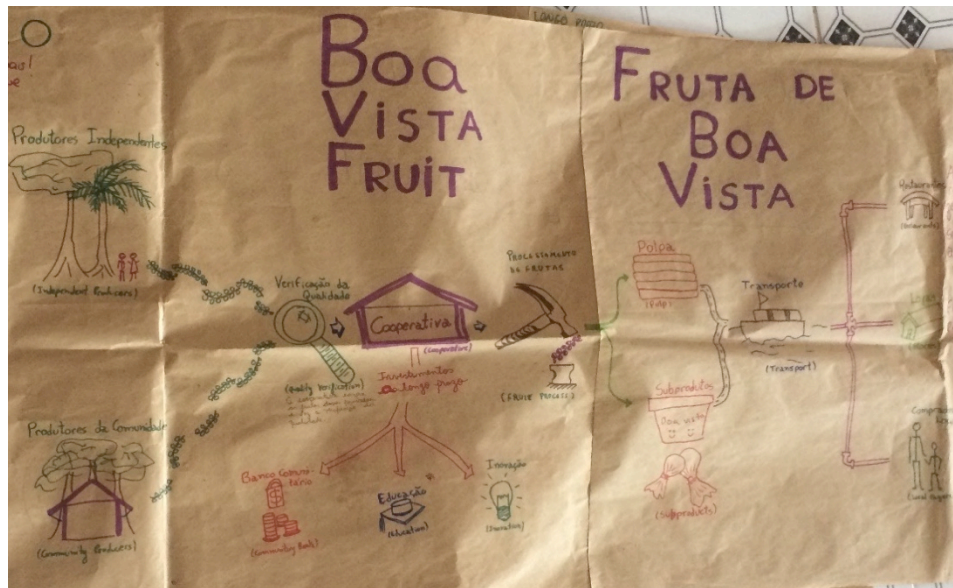
**PICTURE 5** – Stage of the holistic map with the main topics highlighted with a thicker pen.



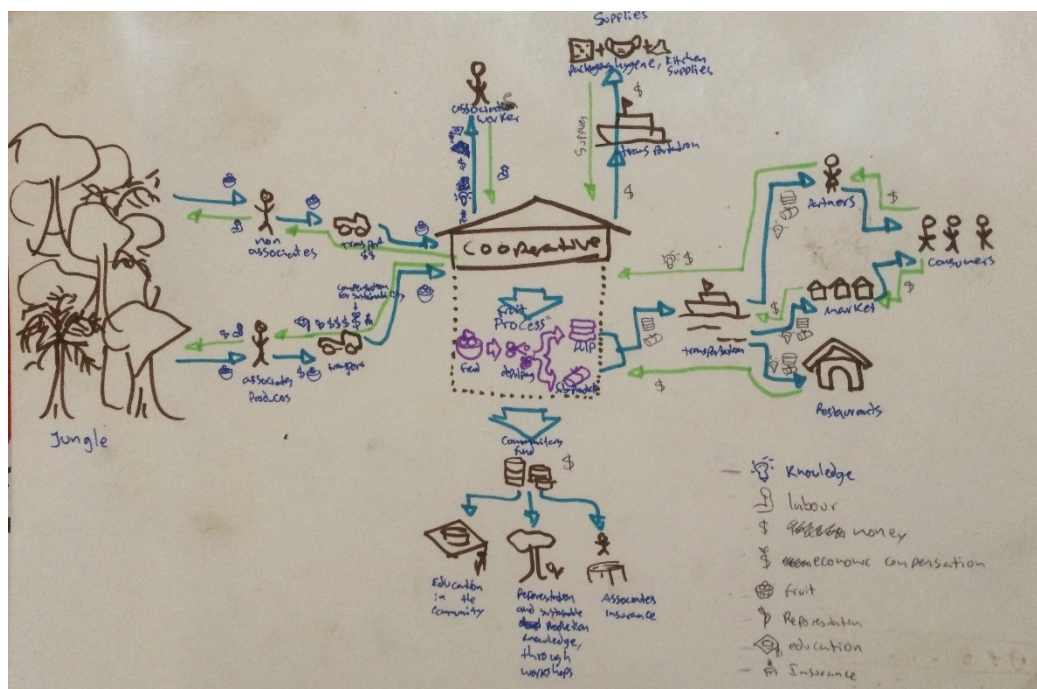
**PICTURE 6** – Concept map of possible solutions. In this map you see as a short term solution the pulp machine and as a long term solution the work with the fruit trees. This solution was later on reviewed.

### 2.3.2.2 value cycle

The value cycles show the different value exchanges of the process. Making value cycles helped the group to understand the fruit business and played a very important role in the business model. On the **picture 9** and the pictures below, you can see different value cycles made by the group throughout the project.



**PICTURE 7** – One of the firsts value cycles drawn by the group. At this point the value cycle was much more simplified than the final version.



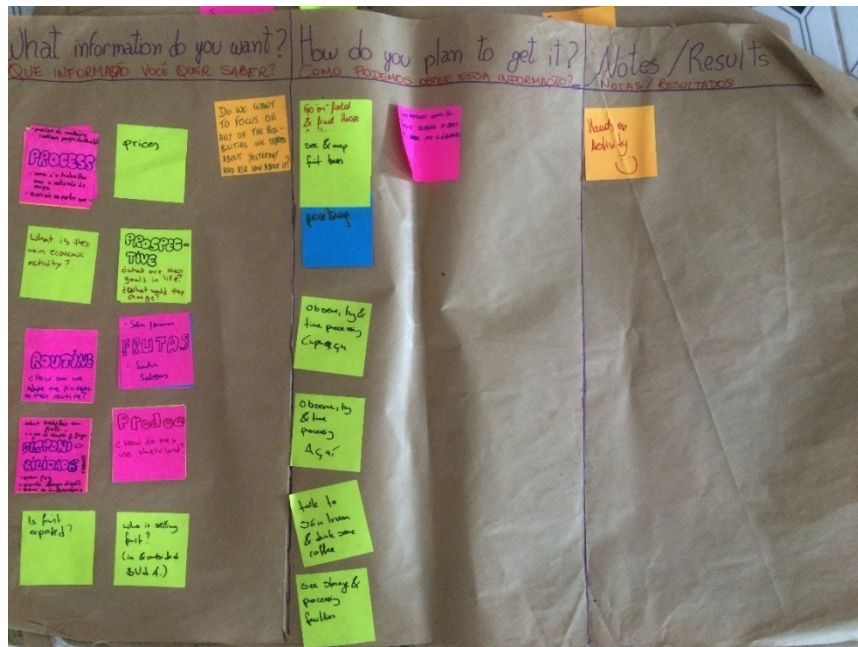


**PICTURE 8** – A more complete value cycle. This was essential to the final version.

### 2.3.2.3 gathering information

After the stakeholder analysis there were still some important and more specific information the group needed to gather. To organize the missing information, the group did the **table 3** below.

**TABLE 3** – Organizing the collection of missing information



After the table was made, it was clear that part of the group needed to go to the capital Belém in order to better understand the potential buyers. Since the focus was on the restaurants.

The visit to Belém played a very important role on the decision of the project course.

Five main information were obtained at this stage:

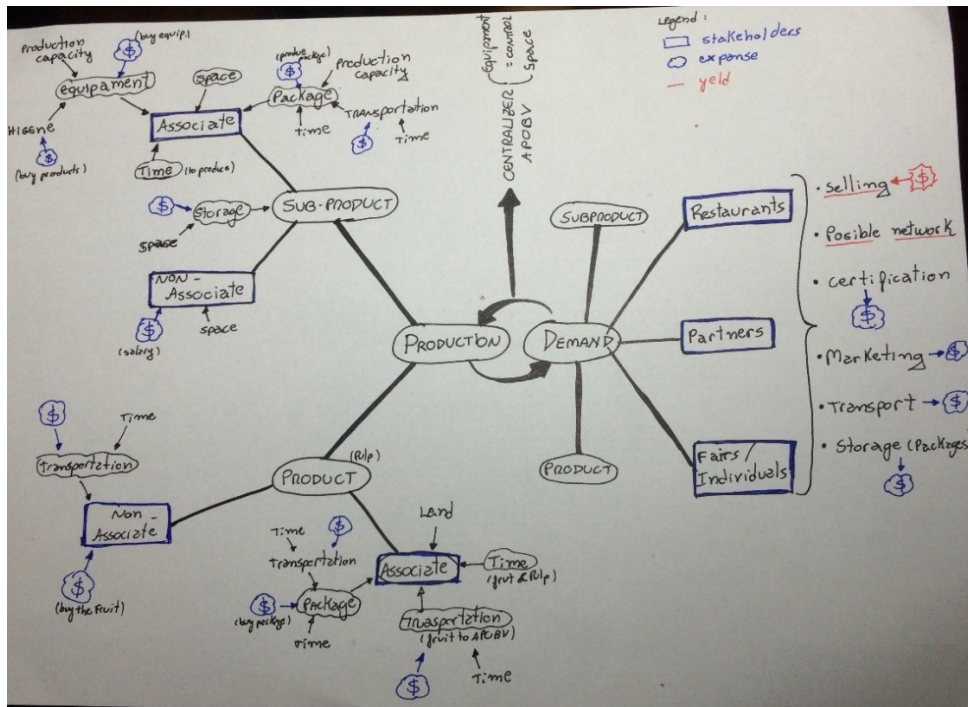
- 1) The restaurants requested for a yearlong supply — this means that the storage of the pulp was crucial.

- 2) Most restaurants bought the pulp directly from C.A.M.T.A, a huge Cooperative that distributes pulp in a national range.
- 3) All restaurants requested quality hand-chopped pulp of cupuaçu instead of machine-pulped.
- 4) Some chefs were willing to make partnerships with local producers and even re-sold their products. For example, the chocolate “Filha do Cumbu” made by Dona Nena was resold by many restaurants.
- 5) We were able to find out the average demand of pulp from the restaurants. They almost never bought raw fruits.

The visit to Belém encouraged the idea of visiting the chocolate producer Dona Nena. Beyond having partnerships with all of the known chefs of Pará, Dona Nena is an old friend of the Boa Vista do Acará's community.

There were three main goals of visiting Dona Nena: re-kindling the connection between Dona Nena and community members, learning the process to make chocolate and cupulate and speculating about a partnership between APOBV and Dona Nena. An interesting highlight is that Dona Nena's working place has become a touristic location.

Another holistic sketch (**picture 9** below) of the fruit business was made. This sketch included the demands within the process such as time and money. The scheme also includes the main stakeholders.



PICTURE 9 –Holistic map with the transactions and stakeholders.

## 2.3.2 Synthesis

### 2.3.2.1 analysis

After the phase of gathering information, it was time to synthesise the situation. The information was organised in various tables.

TABLE 4 – Production of the members of the Association and Production of the whole community

	Weekly Production Throughout the Year						
	Association		Non Associate		Consummed (by the community)		Potential for the Association
	Fruit	Pulp (kg)	Fruit	Pulp	Fruit	Pulp (kg)	Pulp (kg)
Cupuacu	400 uni	132,8	8,000 uni	864		8	124,8
Bacuri	-	-	-	96			96
Abacaba	32 baskets	-	800 cans	-	6 basqueta		-
Uxi	12,000 uni	480	80 - 160 thousand	576 - 1152		4	476
Tucuma	-	-	1,600 - 2,400 uni	-			-
Pupunha	200 cachos	64	960 - 1920 kg	307.2 - 614.4		4	60
Mari	2,560 uni	102,4	24.96 thousand	998.4		4	98.4
Manga	4,000 uni	600	-	-		4	596
Acai	24 baskets	-	-	-	8 basqueta		16

TABLE 5 – Average Restaurant Demands per Week

	Pulp (kg)
Cupuaçu	15
Bacuri	10
Graviola	12
Pupunha	10
Manga	5

Important Information:

- 1) In order to know the number of days that needs to be used for pulping: you have to multiply the weekly demand by 50 (number of productive weeks in a year) and divide by the daily production of a person (in average is produced 16 kg of pulp in a day of work)
- 2) In order to know the amount of freezers needed: you have to multiply the weekly demand by 50 (number of productive weeks in a year) and divide by the amount 1kg bags of pulp a freezer can store on average (about 200 bags)

An important conclusion is that the production of the fruit was not an immediate problem. After all, to end the Associates supply of cupuaçu it would take more than the average demand of eight restaurants and over 30 freezers to store the pulp. This dependency of the amount of freezer was a limiting factor to the pulp business. Therefore, it was chosen to give preference to a high margin profit product followed by a great quality and an organic production.

This discovery also led to the abandonment of the idea of developing a de-pulping machine. Here, several more discoveries were made: machines used to depulp Açaí are available in many households of associates. These machines can be used to de-pulp Cupuaçu as well, however, the quality of pulp is greatly reduced, as use of these machines requires the addition of water. The market demands hand pulped products. Machines specifically for depulping Cupuaçu are available on the market and could be purchased by APOBV.

After analyzing the situation, decided to focus on two parts: the development of a business plan with a network of potential buyers and partners

and the development of the prototype of a sub product from fruit or fruit with its natural packaging and a logo for the APOBV food production. This decision was approved by team member and associate Paulo, by Jose Maria, the president of the association and by Debora Chagas, a further associate.

### **2.3.2.2 design requirements**

For a more detailed description of the design requirements please see Section 3.

### **2.3.2.3 idea generation**

Using various techniques we generated ideas for possible sub products that would allow the association to reach the described goals.

All the ideas from the brainstorm were discussed and assessed using the design requirements. Using these requirements the team decided to focus on Cupuaçu as the target fruit, given its relatively high value, abundance in the community and availability in the season. Specifically, the team focussed on developing a chocolate-like product from the fruit seeds, called Cupulate. Other ideas that matched the design requirements were documented as suggestions for later development by APOBV.

## **2.5 Experimentation**

### **1) Sub-product and natural package**

After the conclusion of investing time on the cupuaçu's seeds, a first attempt of making cupulate was made. The recipe was simple, it consisted of boiling and grinding raw seeds. However, it resulted on a bitter liquid far from the flagrancy and consistency expected of a cupulate. The first experiment is showed in **picture 10** below:





**PICTURE 10** – First cupulate prototype.

The failure of this initial trial also further encouraged the team to visit Dona Nena, the producer of chocolate and cupulate in Pará, as mentioned earlier. For the visit the team was joined by several members of the association and the larger community of Boa Vista do Acará as well as Paula, a member of the organising team and food specialist currently working with Dona Nena

From Dona Nena, the group obtained a new recipe:

- 1) The seeds of the Cupuaçu must be fermented for about 3-5 days
- 2) After fermentation the seed must dry in the sun for about 10-15 days depending of the sun. The **picture 11** below was taken in Dona Nena's place.



**PICTURE 11** – Seeds of cacao are drying on the sun at Dona Nena's.

- 3) The seeds must be toasted in an oven for about 30 minutes
- 4) Now the seeds must be peeled, which is the most labour-intensive part. It takes about a day of work to obtain 1 kg of seeds.
- 5) After peeling the seeds they are ground and formed into bars - the Cupulate is ready.

The different stages of the seed as long as the mowing equipment is showed on **picture 12** below.



**PICTURE 12** – Different types of seeds and equipment at Dona Nena's.

Some prototypes of the package were made out of the shell of the cupuaçu, leaves and bamboo. The first experiment was to verify the capacity of conserving the food. The prototype is shown on **picture 13** below:



**PICTURE 13** – First package prototype with shell of cupuaçu

## 2) Business Plan

Before starting the business model, the group asked other participants about alternative economical models such as CSA (Community-Supported Agriculture). Another source of knowledge were the books of Regenerative Capitalism and Regenerative Enterprise.

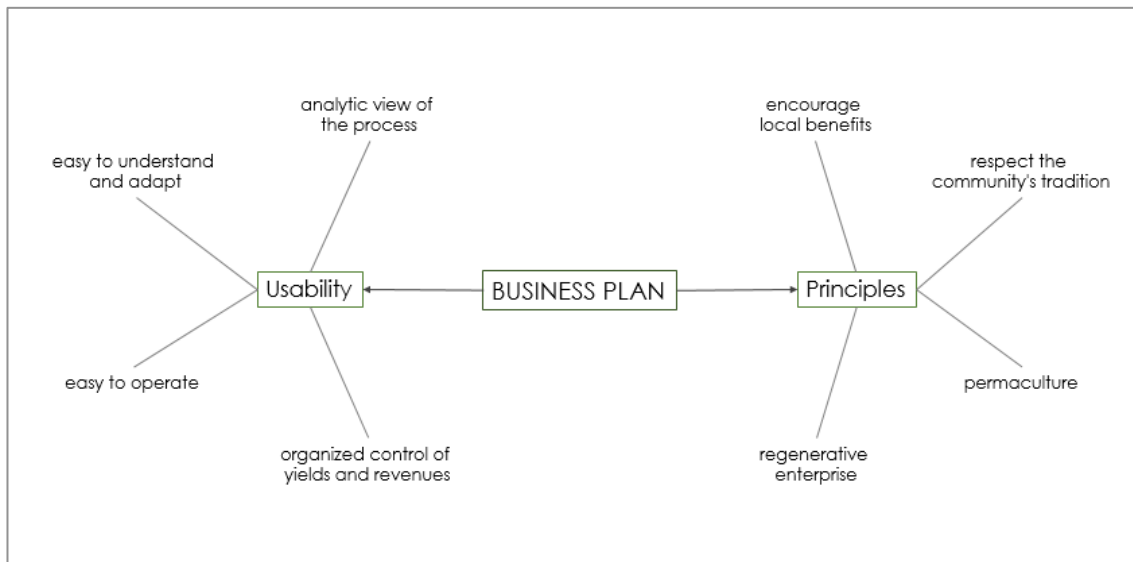
It was settled that the business model would be made out of three parts:

- 1) Customer Value Chain Analysis – map of transactions
- 2) Costs and Revenue Table
- 3) A recommendation of the following steps, in an environmental and in a business perspective

### 3. TECHNOLOGY AND FINAL PROTOTYPE

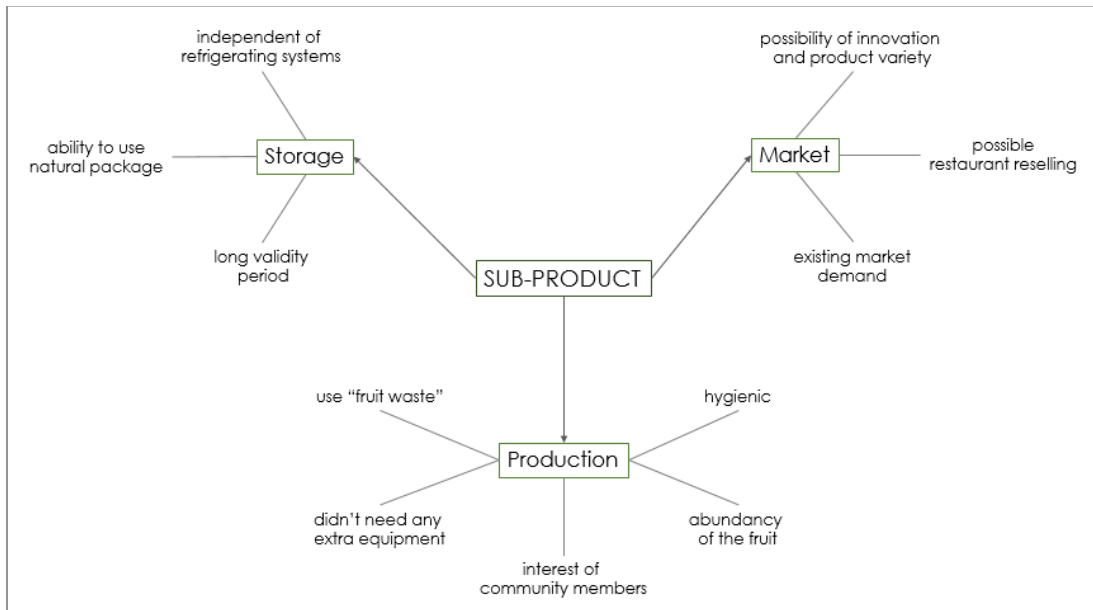
#### 3.1 Design Requirements

The design requirements of the business plan are shown on **picture 14** below:



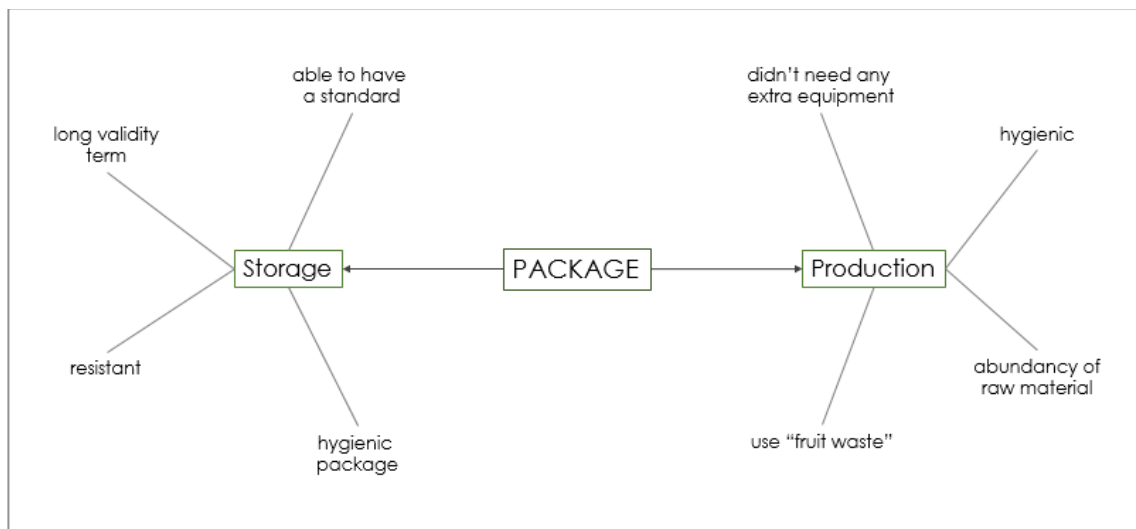
**PICTURE 14** – Design requirements for the business plan

The design requirements of the sub-product are shown on **picture 15** below:



**PICTURE 15 – Design requirements for the sub-product**

The design requirements of the natural package are shown in **picture 16** below:



**PICTURE 16 – Design requirements for the natural package**

### 3.2 Final Prototype & Performance

#### 1) Sub-product

As our final gastronomic prototype, we've made a production of 400g of Cupulate wrapped in natural Cupuaçu leaves. This cupulate was all made with seeds wasted from the pulping process and were collected from many people's gardens where most of the seeds were already fermenting on the ground, which is not ideal but acceptable for prototyping given the time constraints.

After being collected, the seeds were all dried in the sun for 3 days and then toasted in an oven and peeled.

During the final presentation, we demonstrated all the steps in chocolate and cupulate process that we've learned during the summit: The raw fruit, the pulp, the seeds fermenting in a basket, the dried seeds and the almonds obtained after unpeeling the seeds.

People in the presentation were able to crush the almonds in a pestle and make their own chocolate. All these steps were condensed in a small tutorial engraved in wood and given to the community.

We also presented a raw chocolate made by Mr. Ivan's family, members of the association, a cupuaçu jam and a "brigadeiro", typical dessert from Brasil made by the women in the summits kitchen.

The natural packaging research ended with some prototypes to store the products, such as bamboo tubes, cupuaçu shells, cacao and cupuaçu and leaves, açaí and muriti fiber etiquetes.

The public was enthusiastic about the process and specially about the foods that were offered. On **pictures 17, 18, 19** and **20** below you can see the results:





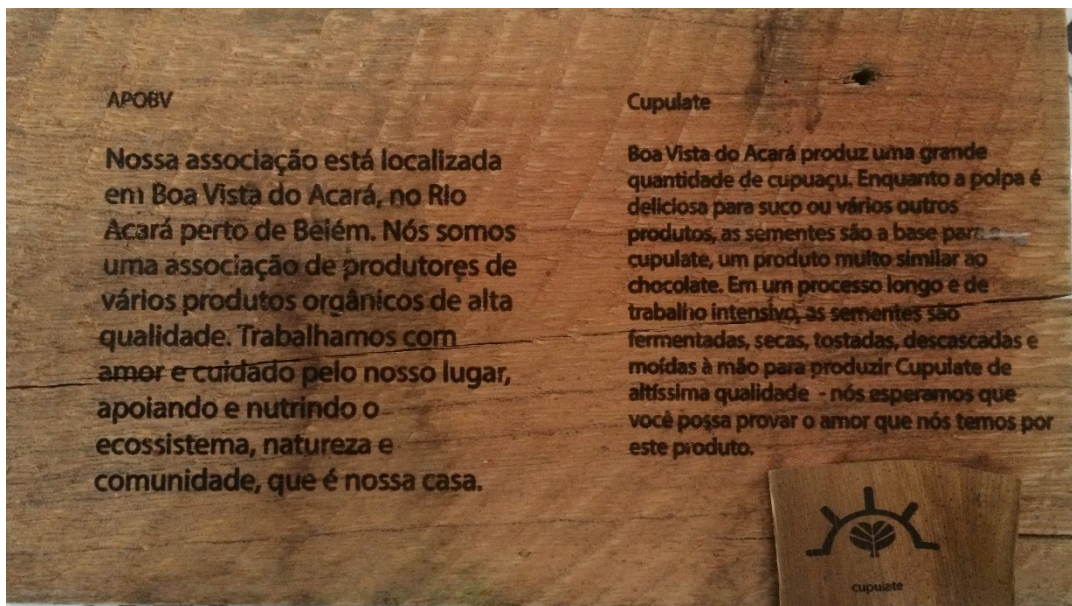
**PICTURE 17** – Products that were presented for the community



**PICTURE 18** – Closer look at the cupuaçu package (shell and leaf)



**PICTURE 19** – Wood-printed cupulate/chocolate recipe for the community



**PICTURE 20** – Wood-printed logo and history of the community & cupulate production

The group also did a list with suggestions for future sub-products such as: jam with the shell of bacuri, dehydrated fruit, seeds oils

## 2) Business Plan



Two major restrictions for the business were identified:

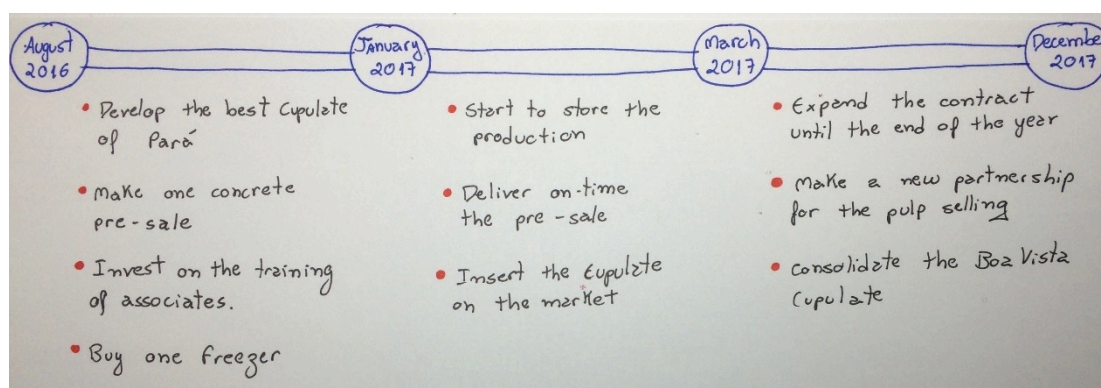
- 1) Lack of freezers severely limits the possible year long storage of available fruit
- 2) Lack of a quality standard for the sub-product – after all, the community was just starting to develop a commercial product.

Considering that the APOBV already had an organic certificate for the fruits, it wouldn't be complicated to obtain the organic certification for the pulp and the sub-product production.

This led the group to target a market fraction with these characteristics:

- 1) High-gastronomy or eco-friendly restaurants that was interested in knowing the producers and buying a high quality, organic certified pulp.
- 2) This market was opened to the idea of re-selling products made by local producers – as long as they were good quality products.
- 3) Consumers that wanted to benefit the local producer.

With that in mind the group did a recommendation for the following steps, in an environmental and in a business perspective. On **picture 21** below you see an overview of a possible development for 6 months.



**PICTURE 21** – Business planning for the following 6-months.

The team discovered that in order to sell all the estimated left production of the fruit (production minus part reserved for local consumption), the association would need over 30 freezers, which limits the scale of the economic activities related to selling pulp. This restriction also means that as long as no investment is made into procuring such a large amount of freezers ecological concerns of extracting an important element from the local ecosystem were minimal.

However, when it comes to the bacuri fruit the recommendations were a bit more specific. After all, bacuri was one of the most valued fruits in the market and the Association had very few bacuri trees. Considering that with the locally practised re-birthing technic the bacuri tree takes at least 3 years to produce, we highly encouraged the learning about the bacuri production and plant it right away. The bacuri tree develops even in poor soils and is used to reforestation.

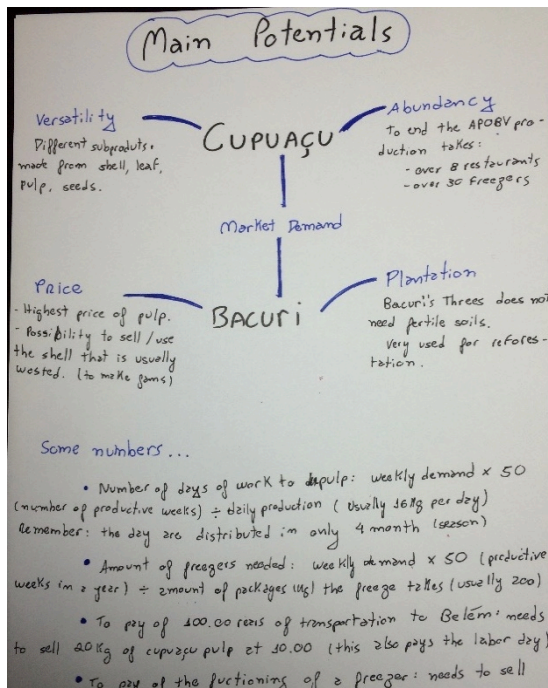
Another recommendation if the pulp selling started to increase, was to buy a Cupuaçu's pulping machine. The machine would preserve the quality of the pulp and due to the size of the cupuaçu's seed it would probably be used to bacuri as well.

The final value chain map included all the transactions related to the fruit business. This way, the Association can have a general overview of what is happening and address individual elements of the business when appropriate or necessary. The map also suggested some long term investments such as workshops for the producers so they could better manage the land and production, an investment into freezers as well as a Cupuaçu dappling machine at a certain point of production size. The value proposition map is shown on **picture 18** below:

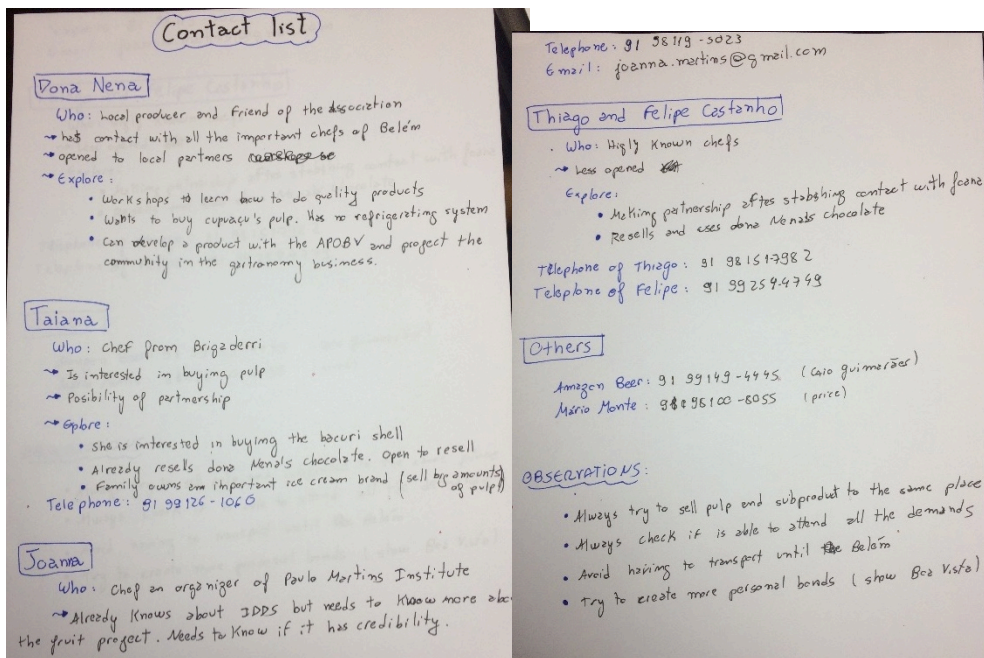


**PICTURE 22** – Customer value chain analysis

It was also delivered two main schemes shown in **pictures 23** and **24**:



PICTURE 23 – Map of the biggest fruit potentials with some important information.



PICTURE 24 – Network list made with potential buyers and partners. The map includes opportunities and contact number.

The final part of the business model was the calculation of estimated costs and revenue. The information as organised in several tables. The sheets included money, time and labor demands. You can see the results on the tables below:

**TABLE 6 – Pulp:** organization of the weekly demand and profit of each restaurant and the total demand and profit of each fruit

Faturamentos Obtidos por Semana							
Lugar	Fruta	Total Vendido (kg)	Preço de Venda (kg)	Valor Total da Venda	Fruta	Demanda Total (kg)	Valor Total Arrecadado
X	Cupuaçu	16	10	R\$ 160,00	Cupuaçu	20	200
	Bacuri			R\$ 0,00	Bacuri		
	Manga			R\$ 0,00	Abacaba		
	Pupunha			R\$ 0,00	Açaí		
	Açaí			R\$ 0,00	Abacaba		
Y	Abacaba	4	10	R\$ 0,00	Pupunha		
	Cupuaçu			R\$ 40,00			
	Bacuri			R\$ 0,00			
	Manga			R\$ 0,00			
	Pupunha			R\$ 0,00			
	Açaí			R\$ 0,00			
	Bacaba			R\$ 0,00			
	Graviola			R\$ 0,00			

**TABLE 7 – Pulp:** weekly money expense separated by stakeholders and description of the activities. This way the Association can see where are the biggest expenses.

Despesas Contraídas por Semana					
Pessoas Envolvidas	Área de Despesa	Descrição	Preço de mercado	Quantidade	Valor Total
Associados	Embalagem	Compra do plástico	4	1	R\$ 4,00
		Transporte do plástico ate a Ass. Contar o preço da gasolina e a quantidade de litros gastos	3	2	R\$ 6,00
	Transporte	Transporte da da fruta ate a Associação	3	3	R\$ 9,00
		Transporte da polpa ate o destino final (se houve)			R\$ -
Armazenamento	Na Ass. Preço do kWh e quantidade de kWh consumida em uma semana de um congelador vezes a quantidade de congeladores da Ass.	0,749	22	R\$ 16,48	
Não Ass. Comunidade	Compra da Fruta	Cupuaçu (preço pelo qual comprou a fruta)			R\$ -
		Bacuri			R\$ -
		Abacaba			R\$ -
		Uxi			R\$ -
		Tucuma			R\$ -
		Pupunha			R\$ -
	Mari			R\$ -	
Transporte	Da comunidade ate a Associação			R\$ -	
Não Ass. Outros	Compra da Fruta	Cupuaçu			R\$ -
		Bacuri			R\$ -
		Abacaba			R\$ -
		Uxi			R\$ -
		Tucumã			R\$ -
		Pupunha			R\$ -
	Mari			R\$ -	
Transporte	Do lugar ate a Associação			R\$ -	

**TABLE 8 – Pulp:** demands of time with each activity. This way the Association can control the time/money balance.

Demandas de Tempo							
Atividade	Descrição	Tempo (min) por kg	kg	Tempo Total (min)	Número de Pessoas	Tempo por Pessoa (min)	
Embalar	Colocar a polpa no saco e no freezer	1	16	16	1	16	
Transportar	Fruta da Comunidade até Ass.			120	1	120	
	Fruta da ilha			0	1	0	
	Colocar a polpa no carro	1	16	16	1	16	
	Transportar da Ass. Ao destino final X			60	1	60	
Despolpar	Cupuaçu	25	16	400	1	400	
	Bacuri			0	1	0	
	Manga			0	1	0	
					0	1	0
					0	1	0
					0	1	0
					0	1	0
					0	1	0

**TABLE 9 – Pulp:** General weekly balance of the business

Balço Geral Semanal	
Saldo no início do ano	R\$ 0,00
Faturamento Bruto	R\$ 200,00
Total Obtido	R\$ 200,00
Despesas Projeto	R\$ 35,48
Disponibilidade Operacional	R\$ 164,52

**TABLE 10** – Pulp: Profit division according to the contribution of each associated. The final value includes the operational costs.

Cupuçu				
Lucro Total por Semana	200			
Quantidade Total de kg	20			
Preço Médio do kg da Polpa	10			
Nome	Quantidade Fornecida Fruta (unidade)	Quantidade Fornecida de Polpa	Quantidade Total de Polpa (kg)	Lucro de Cada Pessoa
João	12	5	9	81,1305
Pedro	0	7	7	61,1305
José	3	0	1	1,1305
Paulo	0	3	3	21,1305
Checar para ver se fecha a divisão			164,522	
Substituir na Fórmula do Lucro o valor do preço médio!!! =(D6*PreçoMedio)				
Gasto das despesas da Fruta	35,478			
Taxa para cada Ass	8,8695			

**TABLE 11** – Sub-product: demands of time with each activity. This way the Association can control the time/money balance.

Demanda de Tempo						
Atividade	Descrição	Tempo Gasto por kg ou potes	Quantidade (kg)	Tempo Total	Número de Pessoas	Tempo por Pessoa
Fermentar (dias)		5	-	#VALOR!		#VALOR!
Secar (dias)	por no sol	15	-	#VALOR!		#VALOR!
Forno (horas)	usar o fogão da mandioca	0,5	1	0,5	1	0,5
Descascar (Horas)	tirar a casca com faca	7	1	7	1	7
Moer		0,5	1	0,5	1	0,5
Brigadeiro (potes)		0,5	1	0,5	1	0,5
Embalagem	Cupulate bruto	Falta dado		#VALOR!		#VALOR!
	Brigadeiro de Cupulate	Falta dado		#VALOR!		#VALOR!

**TABLE 12** – Sub-product: weekly money expense separated by stakeholders and description of the activities. This way the Association can see where are the biggest expenses. It is also helpful for pricing the sub-product.

Brigadeiro de Cupulate - Custos de Produção			
Produto	Preço	Quantidade Usada	Custo Final
Cupulate Puro (em pacotes)	10	1	10
Leite Condensado (latas)	3	2	6
Manteiga	1	1	1
Custo da Embalagem (unidade)	4	10	40
Quantidade para produzir 1 pote	5,7		

**TABLE 13** – Sub-product: organization of the weekly demand and profit of each restaurant and the total demand of each sub-product





Um pouco sobre o diferencial entre a Ass e a CAMTA
Ass é de produtores locais, aumenta a relação pessoal entre consumidor e produtor
Os produtos são de alta qualidade, sendo manualmente selecionados
Pega uma fatia de mercado diferente da CAMTA
Valoriza mais o cuidado com o solo, sendo uma extração consciente

Obs: a Portuguese version of all the maps was delivered to the Association

### **3. Bill of Materials**

#### **1) Sub-products**

##### **a. Cupulate**

- i. Prepared seeds
- ii. Mortar and pestle (grinding)

##### **b. Nibs of Cupuaçu**

- i. Prepared Seeds
- ii. Knife (chopping)

##### **c. Cupuaçu Jam**

- i. Pulp of cupuaçu
- ii. Brown sugar
- iii. Lemon
- iv. Stove

##### **d. Brigadeiro of Cupuaçu**

- i. Prepared Cupulate
- ii. Condensed milk
- iii. Nibs of Cupulate / prepared Cupuaçu seeds
- iv. Stove

#### **2) Package**

- a. Bamboo
- b. Wood printer

- c. Cupuaçu's shell
- d. Cupuaçu's leaves
- e. Açaí's leaves
- f. Saw
- g. Muriti's fiber

## **4. LESSONS LEARNED**

### **4.1 How does the project fit into the context**

The fruit project aims to benefit the community and the Association. The project involves not only associates but also other local producers and workers. The local producers wouldn't have to spend money with the transportation to Belém and would be able to sell to the Association. Also, other interested in the production of the sub-product could get involved in the business.

Besides encouraging reinvestment into the community, e.g. various forms of education, reforestation, health- and old age funds and community ties the fruit business also connects with other IDDS projects. The biggest relation is made with the Herbal group. They developed a smell trail that could be a touristic attraction. The production of the sub-product could also become a touristic attraction. Another relation is with the development of a brand for the community. This brand could be used for future products that the community may produce such as a pripioca perfume.

### **4.2 User Feedback**

The research in Cupulate process received a lot of attention by the community, especially the women that already liked to work with gastronomy and went with us to visit Dona Nena. These women form a core group of the people interested in making cupulate with the seeds wasted during the pulping process.

After tasting the prototype, they all got really excited about starting this work and making their own products together. We've scheduled a presentation in



September where these women will learn and have a graduation about hygienic procedures

Mr. Ivan, a local fruit seller, liked that his products were being showed in the presentation and said that he would, for the first time, sell his home-made chocolate in the fair. Mr. Ivan's enthusiasm was also perceived when he went with his daughter to Belém to see the possibility of buying a Cupuaçu's pulping machine. He wanted to professionalize his fruit selling.

Mr. Paulo and his wife were also excited about having an extra income with the fruit. He said that even if the Association gives up on the project he will work with the fruit. After all, he was not in a good health condition and he was not able to do hard labor on plantations. He said that he didn't want to waste anymore fruit specially the seeds of cupuaçu. Mr. Paulo was also a member of the group and said that we learned a lot about the process of design.

The business model was mainly discussed with the president of APOBV. He was very interested in learning how to make and use the excel sheets. He said that the sheets would make easier to control APOBV profits and expanses. He was also very interested in the network that was made by the group. He thought that it would make easier to enter the market. He also liked the profit division table that helped the negotiation inside APOBV.

In discussion with several potential buyers the viability of the business was tested. Several restaurants were interested in purchasing various products from APOBV (pulp, fruit shell for further production, cupulate). One potential buyer and partner, Dona Nena, purchased pulp during a visit of her to Boa Vista do Acara, facilitated by the team towards the end of the summit. She also discussed the possibility of buying pulp on a regularly basis and starting a partnership with APOBV or individual associates.

### **4.3 Troubleshooting**

The biggest challenge on the business plan was to organize it in a useful and understandable way for the association. Many were not used to work with Excel or transaction maps as developed by the team. The group opted to work as much as we could with diagrams and verbal communication.

A challenge was to identify a “champion”, a member of the association that was not just interested to be a part of the project, but be responsible to facilitate its development. This also made communication of the relevant information as gathered by the team difficult. The group opted to share the information with several members of the association, including the president.

## **5. CONTINUTY**

### **5.1 Reflection on the Project Viability and Other Design Opportunities**

In general the research of the team determined that the project is indeed viable. Through several activities the income generated from fruit can be increased. This includes selling raw pulp as well as the development of various sub products. However, there are at least three major factors limiting the viability and scale:

- 1) Commitment of the association. Given that the project is in a very early stage it needs considerable leadership and initiative from within the association or community to further develop the activities related to pulp and the development of sub products.

- 2) Governmental structure of the association. The association applies a certain model to their current sole joint activity, the selling of pulp. Here all families are active and receive a fair share. The different activities related to fruit would be done by different families and associates, and would have different profits. To avoid feelings of unequal shares a structure needs to be developed to distribute work and profits in a way that satisfies all members of APOBV.

- 3) Storage. As can be seen from the calculations the storage of pulp poses a strict limit the selling of pulp. Only a certain amount of the available fruit can be stored past the main harvesting season given the current availability of space and freezers. Considerable investments would need to be made to be able to store all available fruit or the responsibility of storage is transferred to the buyer, as is the case with pripioca

During the time of the summit the team determined that there are several members from the association interested to work and learn about sub-products from the fruits they harvest, including team member Seu Paulo. The project is extremely viable but it is also very fragile without a serious commitment.

### **5.2 Continuity and Dissemination Mode**

Concerning about the follow-up of the project, it is necessary to have contacts among the team of the group and a person in the association. It is planned that a member of the group will be in direct contact with the Association, gathering news of the development of the project in a two-week basis. This way the Association will have a consulting team.

Currently interested members of the association or their family members include Seu Paulo (team member), Helen Irvan (daughter of an associate), Jose Maria (president of APOBV), Debora Chagas (member of the association), and Forgot her name

Besides the members of the association and team, some other people already communicated interested in contributing to the project. Paula, a food technician, wants to stay involved and already scheduled a workshop in September about hygienic procedures and certificates. José, an engineering student from Belém wants to help on the development of the business model.

### **5.3 Anticipated Risks and Challenges**

The Association works in a group decision manner. In our time in the community there was no Association gathering. This means that we don't know who will be in charge of the business nor how will it be organized. The lack of responsible people for the project represents the biggest risk. This could mean that the initial enthusiasm with the business may go away.

## **6. CONTACT INFORMATION**

### **6.1 Team Members and Point of Contact**

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