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# Business proposal for a Permaculture Homestead farm in Curaçao

A start-up farm of 2 hectares  
permanent agriculture



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## 1 Aim of this proposal

Dear reader,

This proposal is aimed at informing different stakeholders, domeinbeheer (and government) and finance lenders alike. With this proposal I would like to ask you for help to find land for a sustainable permaculture model farm here on Curaçao. The most ideal situation would be an already wooded land, such as a manzalinja forest, and converting that to a productive food forest. This is the time to choose for sustainable, long-term and community supported agriculture. Especially here on Curaçao, an island characterised by a semi-arid climate, accompanied by the difficulties of different forms of dependencies that characterize small island states, this proposal would strengthen in the preservation of natural resources, protection of the environment, and provision in locally produced food. This farm will be a model farm where research and development go hand in hand with local, small scale innovation and sustainability. The world, and this island are hungry for good sustainable permanent agricultural examples.

In this summary I submit a cost/benefit-analysis for the farm I would like to start-up, and for whom I ask this land. Alongside this, a short description is given of the agribusiness for which the applied grant is intended; its core methods; its income diversification; and business model. Thirdly is discussed the cost/benefit-analyses in which a detailed discussion is given on the intended costs of start-up and on the planned income generation over time. A business model canvass can be found in the larger business plan.

## 2 Value proposition

I believe the strength of an agricultural endeavour in present times, especially in a semi-arid region, lies in its income- and biodiversity. Mono-cropping and delivering goods to a wider (international) market increases the risk of disease and failure in crops (internal risks) as well as the risk from volatile market fluctuations (external risks), resp. In the introduction I gave some examples in the past of export-oriented production that would not last. On the other hand, focussing on a permanent agriculture (= permaculture) producing for the local needs (CSA) will mitigate these risks and increase the farm's dynamics, innovative products and its ability for on-the-spot (i.e. 'freshly delivered') production. In this chapter I describe the income generation modes in more detail, in the form of marketable products with illustrations. The extent of this farm will be six (6) hectares and will focus on eight (8) types of income generation modes (and one non-commercial line), namely:

1. A vegetable basket for 40 members; 0,25 ha
2. A moringa line for tea (dried leafs), food supplement (powder), oil (from seed), and vegetable growth enhancer (from leaf); 0,6 ha
3. Consultancy in permaculture and sustainable agriculture;
4. A food forest (orchard) with semi-arid superfoods; 1 ha
5. A nature development & tourism over the whole farm and surroundings;

### 2.1 Vegetables basket (0,4 ha)

As production for the wholesale market is losing its profitability (especially here in Curaçao, where wages are relatively high, imports cheap and supermarkets optimizing their margins), farmers worldwide are looking for new models of direct (retail) marketing. This is an increasingly popular concept developing in Europe and the US. It started within the organic and 'local2local' movement as to connect the producer-consumer more intimately. I intend to use 4.000 m<sup>2</sup> for vegetable production, aiming for the supply of 50 membership-households of an average of 4 persons.

This 'vegetable box' is the new 'Community Supported Agriculture' where consumers are interacting and engaging more in the farm's activities. Significant amounts of time and attention is given to the establishment and maintenance of this 'family group of consumers'. After a constant and diversified vegetable production is established, the farm will start conserving the surplus as vinegar, dried, salted, sugared and soured preserves that extend the shelf-life from 2-4 days to 2-4 months.

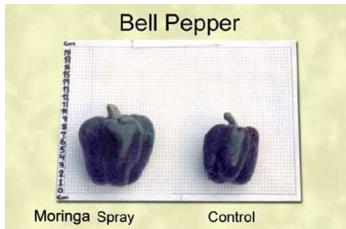


Figure 1. f.l.t.r: a weekly vegetable box to the CSA-community; vegetables and fruit preservation will extend shelf-life, reduce food waste, and increase revenues; a self-made solar drier is an important part of our visibility and status quo; high end tea products from my herb garden are also present.

## 2.2 Moringa Olifeira healthy food supplements (0,6 ha)

Moringa Olifeira is one of the world's most nutritious trees, containing 18 of 22 amino acids (very rare for a plant, including the 8 essential ones), and significant amounts of other nutrients like iron, calcium, potassium, and vitamins. Its leaves are dried and grinded to a powder as a food supplement worldwide, not in the least in developing countries. It's an easy, abundantly growing tree, very drought-resistant that fit perfectly in this climate. All other components of the tree are beneficial and marketable, e.g. as oil (from seeds), water purification (seed cake), medicine (leaf, bark, root) and as livestock fodder. I intend to cultivate 6.000 m<sup>2</sup> harvesting 6 times in a year.

My first and foremost focus in this category will be on a moringa powdered food supplement product. This powder can be added as 1-3 spoons at every dish, smoothie, tea, breakfast or juice. It is dried and grinded, and if stored out of light and in a cool place, it's shelf life is 1-3 years. The processing method is relatively simple, while the end-price, especially in the health niche market is steep. Next to a high-end supplement product, also a share will be sold for a fair, social price to schools to be incorporated in their school menus.



**100g Moringa Dry Leaf =**

- 10 times** the Vitamin A of Carrots
- ½ times** the Vitamin C of Oranges
- 17 times** the Calcium of Milk
- 15 times** the Potassium of Bananas
- 25 times** the Iron of Spinach
- 9 times** the Protein of Yoghurt

These figures reflect gram-for-gram comparisons with Moringa leaves.

Figure 2. f.l.t.r: Moringa processing is a relatively simple technique; moringa powder; powdered and packaged products ready for the market; applying the moringa growth hormone yields significantly larger fruits; moringa oil from seeds; health benefits of moringa on a 100 gr. basis.

## 2.3 Consultancy in permaculture

My work as a sustainability consultant would continue on the farm and focus on sustainable food production based on permaculture. The extra advantage is that now the research and consultancy is based on on-farm experience and experimentation.

1. Consultancy in permaculture; nature hikes; agro-tourism. Consultancy in permaculture will be offered both on- and off-farm. Once the vegetable and moringa lines are established, and the food forest, chicken/pig plots and superfoods section are in preparation, I feel there would be enough material to share with fellow-kunukero's, people interested in homestead farming, agricultural students and agrotourists. Nature hikes are also organized to get acquainted with the results, and to experience the difference with the surrounding mondi. These are also for locals and tourists alike.



Figure 3. f.l.t.r: instruction in cultivation; id in water pacification and conservation; nature hikes; agrotourism is an upcoming market.

## 2.4 Food forest (orchard; 1,0 ha)

While fruits are well cherished on the island, it remains largely imported and extremely expensive. This seems even more dazzling, as most of the retailed fruit types grow perfectly well in Curaçaoan conditions (with sufficient water and care of course). Fruits that are well adapted here and make a good sell are soursop, pomegranate, starfruit, avocado, banana, grapes, mandarin, cashew, and mango. Next to these are planted a range of typical Curaçaoan fruits rarely offered in supermarkets such as guinepp, jamun fruit, tamarind, kashupété, mispel (sapota). Also a range of drought-resistant fruits from cacti are cultivated, such as prickly pear, dragon fruit and nopales, all high-end fruits.



Figure 4. f.l.t.r: Pitaya; fruit baskets for the vegetable/fruit box; dried tomatoes and fruits on vinegar; fruits on alcohol.

### 2.4.1 Semi-arid superfood

Also, for the food forest plot of 1 ha will also be used to grow semi-arid, perennial trees/shrubs with market value. These are not indigenous but drawn from other semi-arid regions worldwide. To achieve permanent agriculture aimed at self-sufficiency, it becomes only logical that species are being used, *where-ever* they may come from. Distinguished universities in Mexico, Nigeria, India, Australia and other countries with a semi-arid climate have all done extensive research and experimentation with these types of fruits and vegetables surviving severe and extended periods of dry spells. Since agriculture is less of a priority in Curaçao this research and experimentation is absent on the island but will be of valuable importance to the community. Collaboration with local environmental NGO's will be a cornerstone of this program, as to carefully examine weeding potential and impact on local flora and fauna.

I would like to experiment with baobab (powdered food supplement), carob (substitute for cocoa), Marula, Bilimbi, dragon fruit, wood apples and dried berries such as goji and Inca berries. These production lines are relatively simple and consist of drying, grinding (optional), packaging and marketing. They will be retailed to high end, organic health shops on the island firstly, and subsequently to the CSA membership base and local supermarkets.



Figure 5. f.l.t.r: Texas persimmon fruit; Carob (chocolate substitute); Baobab (superfood); gojiberries (superfoods); pink pepper tree (spice); mesquite flour from indjú; kenepa roasting has the potential to become one of Curaçaoan first commercialized nut species; super-sweet dried raisin-like candy from the jamun fruit (druifsurinám).

## 2.5 Nature development& tourism

Next to the consultancy part generating an income, also a nature development and tourism section is included. Due to permaculture principles especially designed and applied for this climate a whole newbase of experimental dataabout productive ecosystem development and regeneration will becomeavailable. A new approach is taken, integrating agriculture, ecology and landscape design that will include a.o. large scale standalonemondi of indigenous fruit species; imported species adapted to the climate; controlled short disruption and fertilization by animals; earthworks for water preservation. This will attract a new market of local and international tourists consisting of researchers, green travellers, farmers, local homesteaders and agricultural/nature activists. Excursions are held once a month to groups of 20 people.

### 3 Cost/Benefit-Analysis

In this chapter the cost/benefit-analysis is given that represents the incomes, costs and subsequent required loan for which this document is written. Not all income generation routes are implemented in year 1. These are implemented in succession (in time), and subsequently also its yields, incomes, labour requirement and marketing/packaging/distribution costs increase in time. Also a sensitivity analysis is performed on the net income over 10 years by changing the most important key variables in the setup.

The income generation types are calculated in the formulas of next paragraph.

#### 3.1 Cost calculations

This paragraph elaborates on the cost calculation of the farm. The capital expenditures (CAPEX) are explained, as well as the operational expenditures (OPEX). Following are given several formulas as to calculate the net present value (NPV) over 10 years. The NPV is calculated in formula 9 below:

$$NPV = \sum_{t=1}^T \frac{(B_t - C_t)}{(1+r)^t} \quad \text{Formula 9}$$

Where:

NPV	= Net present value, in fl
$B_t$	= Benefits in year t, in fl
$C_t$	= Costs in year t, in fl
R	= discount rate, in % (3% assumed)
T	= time, in years

In Table 1 below are given the variables for the costs (operational expenditures or OPEX). The initial investment of 128.000 fl (normally called CAPEX) is divided by the years of payback required by your organisation (bank) and then incorporated as an OPEX. Investments 2 and 3 for the chicken and pig route are accounted as OPEX as well and occur in y2 and y3, but are invested with own money from the farm's returns.

Packaging, marketing and labour are OPEX which increase in time with the establishment of their specific route, and thus a time factor unit is applied also.

OPEX	Unit	
Investment 1 (y 0)	florin	127.332
Loan pay-off (y1-y5)	20% over 5 yr	25.466
Land rent	fl/ha/yr	1.000
Labour	fl/hour	12,50
Rent on loan	%/yr	8%
Moringa Packaging& Marketing	fl/yr	13.475
Fruits Pck&Mrkt	fl/yr	6.000
Superfoods Pck&Mrkt	fl/yr	12.200

Table 1. Cost calculations of the operational expenditures (OPEX)

Table 2 below summarizes the complete cost calculation. At full swing, the vegetable line generates the largest income, or roughly 64.000 florin per year, as superfood and food supplement retailed to the customer. Following is the moringa line, at 61.200 florin per year, where on 0.6 hectare a moringa field will be planted. In fact, due to focussing on the end customer (community supported agriculture or CSA) the margins are more favourable. Total benefits at the farm's full swing are 221.200 fl/yr.

Table 2. Cost/Benefit Analysis, devaluated, cumulative and resulting in a NPV of 84.266 fl per year.

Income TYPE V.S. YR	0	1	2	3	4	5	6	7	8	9
Vegetables	20.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000
Moringa	0	25.245	50.490	75.735	76.500	76.500	76.500	76.500	76.500	76.500
Consultancy	3.750	7.500	11.250	15.000	15.000	15.000	15.000	15.000	15.000	15.000
Chickens	0	0	6.600	13.200	19.800	20.000	20.000	20.000	20.000	20.000
Fruit Forest	0	0	4.500	11.250	22.500	33.750	45.000	45.000	45.000	45.000
Pigs	0	0	0	3.750	7.500	11.250	15.000	15.000	15.000	15.000
Superfoods	0	0	0	6.800	17.000	34.000	51.000	64.600	68.000	68.000
Nature development	0	0	1.500	3.000	4.500	6.000	6.000	6.000	6.000	6.000
<b>Total</b>	<b>23.750</b>	<b>72.745</b>	<b>114.340</b>	<b>168.735</b>	<b>202.800</b>	<b>236.500</b>	<b>268.500</b>	<b>282.100</b>	<b>285.500</b>	<b>285.500</b>
<b>(OPEX)</b>										
Land	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
Labour	8.142	10.439	12.024	19.250	26.156	30.778	35.313	36.632	36.962	36.962
Loan repayment		25.466	25.466	25.466	25.466	25.466	0	0	0	0
Interest rate	10.187	8.149	6.112	4.075	2.037	0	0	0	0	0
2nd & 3rd phase investments			27.811	38.479						
Chicken feed	0	0	1.238	2.475	3.713	3.750	3.750	3.750	3.750	3.750
Pig feed	0	0	0	1.563	3.125	4.688	6.250	6.250	6.250	6.250
Moringa marketing & packaging	0	4.447	8.894	13.340	13.475	13.475	13.475	13.475	13.475	13.475
Fruits M&P	0	0	600	1.500	3.000	4.500	6.000	6.000	6.000	6.000
Superfoods M&P	0	0	0	1.220	3.050	6.100	9.150	11.590	12.200	12.200
<b>Total OPEX</b>	<b>24.329</b>	<b>54.502</b>	<b>88.144</b>	<b>113.368</b>	<b>86.022</b>	<b>94.757</b>	<b>79.938</b>	<b>83.697</b>	<b>84.637</b>	<b>84.637</b>
<b>Total minus OPEX</b>	<b>-579</b>	<b>18.243</b>	<b>26.196</b>	<b>55.367</b>	<b>116.778</b>	<b>141.743</b>	<b>188.562</b>	<b>198.403</b>	<b>200.863</b>	<b>200.863</b>
Devaluated	-579	17.374	23.761	47.828	96.074	111.059	140.708	141.002	135.952	129.478
Cumulative	-579	16.796	40.556	88.385	184.458	295.518	436.226	577.227	713.180	842.658
<b>NPV/yr over 10 years</b>										<b>84.266</b>



Costs mostly consist of labour (30.000 fl/yr) and packaging/marketing (20.000 fl/yr for all products). Loan repayment is 26.000 fl/yr, and land rent 2.000 fl/yr. The total cost at full swing of the farm is 51.000 fl/yr.

The cumulative, discounted net profit over 10 years (or NPV) is 935.000 florin. Per year, this amounts to an average of 93.507fl/yr.