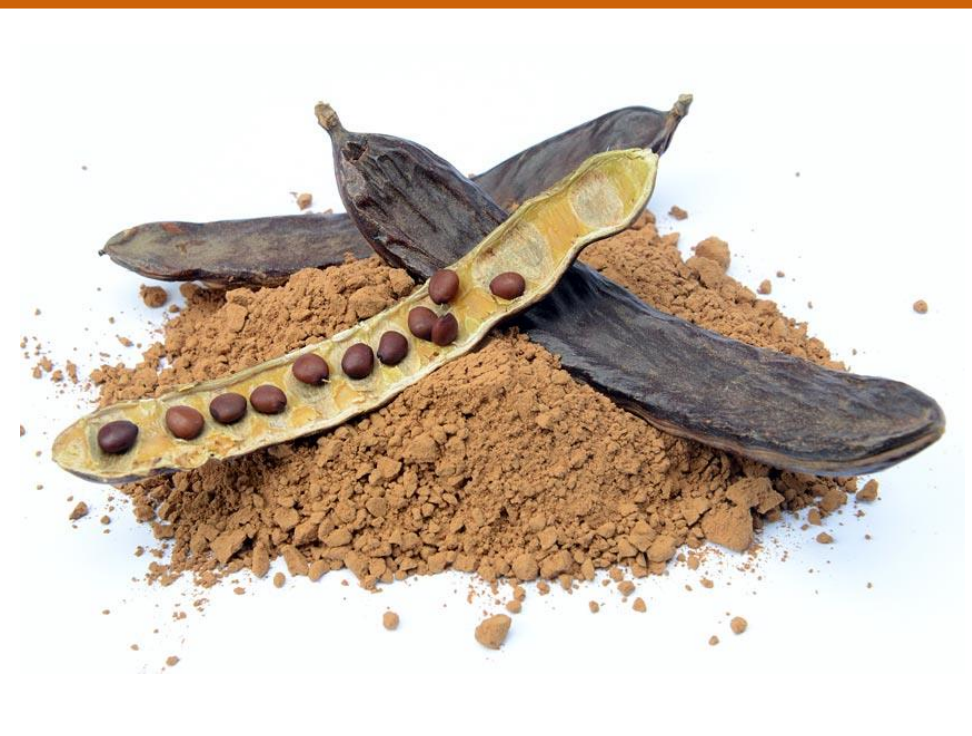




LIFE16-CCA IT 000011

Commercial plan (International): Carob tree (*Ceratonia siliqua*)

Appendix to the Action C7-3



DESERT ADAPT, LIFE16-CCA IT 000011

2022



LIFE Project Number: LIFE16-CCA IT 000011

LIFE Project name: DESERT ADAPT

Data Project

Project location:	Italy, Portugal and Spain
Project start date:	01/09/2017
Project end date:	01/09/2022 Extension date: : 01/09/2023
Total budget:	€ 4.075.040
EU contribution:	€ 2.439.761
(%) of eligible costs:	60%

Data Beneficiary

Name Beneficiary:	Università degli Studi della Campania "Luigi Vanvitelli" (IT)
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Project Website:	Still to come

Report information

Name	Commercial plan: Carob tree (<i>Ceratonia siliqua</i>)
Related action	C7-3
Produced by	FSG
Original delivery time	31-12-2022
Actual delivery time	31-12-2022
Version number	1



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This commercial plan is one in a range of similar documents. List of commercial plans available:

Spain	Italy	Portugal
<p>L5/L6*: Aromatics, Jara (all uses, including oil), Honey.</p> <p>L7: Nuts (Pistachio), Tourism (Bulls & cows)</p>	<p>L1: Aromatics</p> <p>L2/11: Honey + beekeeping in general (selling/buying bee colonies & queens), Wild asperges, Pistachio</p> <p>L4: Sumac (<i>Rhus Coriaria</i>), Prickly pear (all products like Fibre, (frozen) juice, fruits etc).</p>	<p>L8: Tourism.</p> <p>L9: Carob tree.</p> <p>L10: Strawberry tree. Hunting (link with national hunting orgs, photo hunting options).</p>

* L numbers are the landowners in Life Desert-Adapt project that sell these products.

1 Type of product or service

Carob tree (*Ceratonia siliqua*) is a common specie for Algarve but now also in other regions in Southern Europe. The specie is also known in other countries but more as an ornamental tree. The tree can fix Nitrogen (good for climate mitigation projects) and produce interesting fruits at the same time. It is this dual purpose that makes it very interesting. The tree can grow in almost any soil. It cannot grow in the shade. It prefers dry or moist soil but can tolerate drought. The plant can tolerates strong winds but not maritime exposure.

Algarve varietal forms include *mulata*, *galhosa* and the less common *canela*. The carob is integrated into the famous 'dry orchard' agriculture system (pomar de sequeiro) together with almond, olive and fig.

The fruit grows in so called 'pods' that show some resemblance to beans (the vegetable). The pod consists of two main parts: the pulp (the pod itself) accounts for 90% and the seeds/beans for 10% of the pod weight. Inside there are thus indeed beans. From these beans Carob gum is made. In the international market this is called 'locust bean gum, or LBG'. The gum is derived from the split, milled seeds. LBG is used as a stabilizer in foods and medicines (E410).

The rest of the pods are milled into powder. This powder, with a naturally sweet chocolate flavour, forms an ingredient in syrup, flour, cakes and cookies, and as a substitute for chocolate. This is, for example, sometimes sold as Bakery Chocolate Carob Powder or similar products.

The Carob pod can also be consumed directly by humans. It needs to be dried and can be roasted first for extra taste.

Traditionally there are the following main uses.

- Dried and/or roasted pods. For direct consumption.
- Powder or pulp made from the pods. As ingredient in syrup, cakes and cookies, and as a substitute for chocolate
- Locust bean gum (LBG) made from the beans. Stabilizer in foods and medicines.

2 Potential uses of the product or service, and prices.

The following are the most interesting uses of this specie.

International market

Type of use	Explain what it means
Dried and/or roasted pods	<p>Pods are harvested are dried.</p> <p>First year of harvest is 6 years after planting, but only after 25 years is reaches full production. Normally 45 trees/ha are planted. The average yield is 50-70 kg per tree, not irrigated. Total average yield will thus be 2700 Kg/ha (45 * 60).</p> <p>Prices are variable, ranging from €1,00/kg till €2,50/kg for the landowner.</p> <p>At the moment (2022) prices are increasing every year, currently standing at €50/aroba. An arroba is 15 kg. This means €3,33 Euro/KG. There is a big demand for the product.</p>

	<p>We work with €2,50 as the current price, to be on the safe site.</p> <p>This means an income of €6.750/ha ($2700 \times 2,5$).</p>
Powder (pulp) made from the pods	<p>Powder/ pulp is made from the pods.</p> <p>The average consumer price for powder is around €7/Kg. This leads to €2,8 Euro/Kg producer price (40% of consumer price, standard factor). This means an income of €6.804/ha.</p> <p>This is calculated like $2,8 \times (2700 \times 0,9)$. The factor 0,9 is used because 90% of the pods is pulp, the remaining 10% are the beans. Of course you will also have costs to produce the powder.</p>
Locust bean gum (LBG)	<p>Gum is produced by splitting and milling the beans.</p> <p>Importers and factories are paying up to €60/Kg for LBG at the moment. This price is not really feasible for most importers and they are trying to look for alternatives. 5 years ago the price was around €12/Kg. Offcourse you still need to produce the gum and that also costs something (it's a factory process).</p> <p>Around of 10% of the pods are beans. This means that $2700 \text{ Kg/ha} \times 0,10 = 270 \text{ Kg of beans/ha}$.</p>

Used literature:

- [Life Desert-Adapt species database.](#)
- [Pfaf database of species.](#)
- ResearchGate: [Evaluation of fruit and seed diversity and characterization of carob](#) (Ceratonia siliqua L.) cultivars in Algarve region.
- ResearchGate: [Exploratory Analysis of the Productivity of Carob Tree](#) (Ceratonia siliqua) Orchards Conducted under Dry-Farming Conditions.
- Science Direct: [Analysis of genetic diversity in Portuguese Ceratonia siliqua](#) L. cultivars using RAPD and AFLP markers.
- [Portugal resident](#) report about Carob harvest and current prices.
- Carob and Almond Group (AGRUPA). AGRUPA cooperative, Algarve sole association of carob and almond farmers, with around 400 members.



Carob powder (made from pods)



Carob gum (made from beans)

3 Target customers, markets and competitors

International market

Market types			
Name of solution, product or service	Best target customers for each product: Explain your preferred target groups; consumers, retailers (shops), distributors, other landowners, wholesales, catering industry	Best target market for each product: Local, regional, national, international	Include basic information about the competitors. How big are they? Where are they located?
Dried and/or roasted pods	Consumers, & retailers directly , through online sales platforms, ready-made products.	National or even regional because this is niche market.	Reasonable number of local competitors. There are many small local Carob producers willing to sell their carobs if they receive a fair price, or a better price than the products below.
Powder (pulp) made from the pods	Production companies that use this powder for various ingredients (as mentioned in chapter 1). Consumers, & retailers , through online sales platforms, ready-made products.	International Because there is demand for this product in each EU country (and outside the EU).	Reasonable number of competitors. Your main competition comes from small production companies. Each producing country seems to have some of them (Portugal, Italy and Spain but also Morocco and Algeria).
Locust bean gum (LBG)	Factories that need LBG for their products as Stabilizer in foods and medicines. But ofcourse you first need to produce the gum, which is already a factory process.	International. Because factories can be found around the world.	Not many competitors. There are around 10 leading suppliers of the gum (see below), and a few smaller ones in each producing country.

Used literature:

- [News article about price increase](#) and the Caron market in Portugal. Preço da alfarroba quase triplicou desde 2017.
- [Global Trade Mag.](#) Markets for Carob.
- ResearchGate: [Yield and composition of carob bean gum](#) produced from different Moroccan populations
- [Market news USDA \(Carob is not included at this moment\)](#)

4 Market forecast

Carob market information.

Production: The world-wide production of Carob is estimated at about 315.000 tons per year, produced from about 200.000 hectares with very variable yields depending on the cultivar, region, and farming practices. The main producers for pulp & seeds respectively, are Spain (36%, 28%), Morocco (24%, 38%), Italy (10%, 8%), Portugal (10%, 8%), Greece (8%, 6%), Turkey (4%, 6%) and Cyprus (3%, 2%).

Portugal produces around 43.000 tonnes. At this moment there is around 13.595 ha of Carob in the Algarve (which is around 90% of the production of the country).

Imports: In 2018, Italy (6.500 tonnes), distantly followed by Switzerland (3.758 tonnes), Thailand (3.343 tonnes), Egypt (2.530 tonnes), Belgium (2.349 tonnes), Spain (2.018 tonnes), France (1.909 tonnes), the U.S. (1.837 tonnes), the Czech Republic (1.608 tonnes) and Germany (1.556 tonnes) were the main importers of carob, together comprising 80% of total imports.

Export: In 2018, Morocco (20.000 tonnes) and Spain (15.000 tonnes) represented the main exporters of carob in the world, together amounting to near 63% of total exports. It was distantly followed by Algeria (7.538 tonnes) and Portugal (5.452 tonnes), together comprising a 23% share of total exports. Cyprus (2.348 tonnes), Turkey (1.487 tonnes) and Italy (1.121 tonnes) followed a long way behind the leaders.

Consumption: Europe is the largest region of Locust Bean Gum (E-410) Market, of which market size was US\$ 221,02 million in 2021, Europe occupied 60,19% share while North America was 12,97%, and the market value was US\$ 47,06 million. Asia Pacific region is the another one of largest market for Locust Bean Gum, during 2021, Asia Pacific occupied 17,38% in global Locust Bean Gum market.

Forecast: Driven by increasing demand for carob, the market is expected to continue an upward consumption trend over the next seven-year period. Market performance is forecast to retain its current trend pattern, expanding with an anticipated CAGR of +0,8% for the seven-year period from 2018 to 2025, which is projected to bring the market volume to 152.000 tonnes by the end of 2025. Nevertheless there (2022) seems to be reached a maximum price level because buyers are stating to start looking for alternatives. This often means the prices will stabilize and not continue to grow.

International market

Market forecast			
Name of solution, product or service	Describe the current market conditions. For example the forecasted growth or for example a regulation with direct influence on the market. Small/medium/big markets.	Demand. What do you expect? What information is it based on?	Price development. What do you expect? What information is it based on?
Dried and/or	This is a small niche market.	We expect a slow growing market for the years to	Current prices are very high. This is caused by high demand for pods for powder

roasted pods	There are maybe up to 10 small/medium companies offering such products in a more professional way in each production country.	come. These products are linked to normal food consumption.	and gum. Prices remain high in the years to come.
Powder (pulp) made from the pods	This is a medium size and growing market. Trade figures can be found above.	We expect a growing market for the years to come. These products are linked to normal food consumption but also to the clear consumer trend of using more local special products for baking and cooking.	Current prices are very high. This is caused by high demand for pods for powder and gum. Prices remain high in the years to come but will not continue to increase..
Locust bean gum (LBG)	This is a medium size and growing market. Trade figures can be found above.	We expect a stabilizing market. The demand is still high but prices have reached an optimum it seems. Buyers are starting to look for alternatives, which is normally not a good sign.	Current prices are very high. This is caused by high demand. Prices remain high in the years to come but will not continue to increase.

Used literature:

- [Amazon](#) (search per specie)
- <https://www.etsy.com> (search per specie)
- [LBG prices for importers](#). News article.

5 Your opportunities & threats, and how to sell it.

International market

Your potential advantages and threats by selling this			
Name of solution, product or service	Explain opportunities by targeting this product or service.	Advise what the best ways are to sell this product or service (the marketing mix). Think about added-values, packaging, web-shops or not etc	What are the current threats to the market?
Dried and/or roasted pods	Good prices and stable market. You can always enter this market but need to carve out your own sales network.	Directly to consumers or retailers throughout online sales platforms or live sales (supermarkets, fresh markets etc).	Direct competition with other producers. This is a niche market and have to be sold like this (unique product with a good story). In this the story is more important as the product.
Powder (pulp) made from the pods	We expect a growing market for the years to come. These products are linked to normal food consumption but also to the clear consumer trend of using more local special products for baking and cooking.	Direct linking to producers of various ingredients (see chapter 1). Directly to consumers or retailers throughout online sales platforms. No need to sell to intermediate chain segments.	Direct competition with other producers. This is a speciality market and the product have to be sold like this (unique product with a good story). In this the story is more important as the product.
Locust bean gum (LBG)	At the moment record prices are paid. If you are already up to speed and have a factory to produce the gum, make use of the situation. For new-commers, best wait for 1-2 years what the market is doing.	Direct linking to producers of various ingredients (see chapter 1).	Unclear market. There (2022) seems to be reached a maximum price level because buyers are stating to start looking for alternatives. This often means the prices will stabilize and not continue to grow.

Used literature:

- [News article about current prices](#), but also about theft in Algarve.



Carob flowering

6 Potential customers.

List the potential customers for each products. List at least 5 potential customers for each product or service.

International market

Customers			
Name of solution, product or service	Name and location	website	Why?
Locust bean gum (LBG) , Direct linking to producers of various ingredients (see chapter 1). We do not include a list of buyers because there are many. In principle any factory that need LBG or E410 (stabilizer in foods and medicines) can be approached.			
Powder & Dried Pods. If you like to sell your pods to factories that make gum, then this is the list of the biggest producers: <i>DuPont, LBG Sicilia Ingredients, Carob, S.A, Cargill, INCOM A.Ş, GKM Co., GA Torres, Polygal AG, Industrial Farensse and Carob Ingredient.</i> If you like to sell your powder to factories that use this for ingredient in syrup, flour, cakes and cookies, and as a substitute for chocolate it is maybe easier to look for customers yourself. It all depends on the country and what market you target. There can be hundreds of potential customers in each EU country. You can also easily produce the powder yourself and start to sell a special line of Carob powder with a good story behind it. If you like to sell your dried pods or powder directly to consumers then here are some sales platforms to do that:			
a)	Amazon	https://www.amazon.com	Online sales platform, search for the specie.
b)	Etsy	https://www.etsy.com	Online sales platform, search for the specie.
c)	Eko Plaza (in Dutch)	https://www.ekoplaza.nl/	Specially for bio and similar products, direct selling, search for the specie.
d)	Ebay	https://www.ebay.com	Search the specie and see what is online now.
e)	Lazada	https://www.lazada.com.ph	Search the specie and see what is online now.