



MOVING
MOUNTAIN VALORISATION THROUGH
INTERCONNECTEDNESS AND GREEN GROWTH

Policy Brief

CRETE | Carob Flour Value Chain, “Central Rethymno”



Photo credit: Kostis Pigounakis



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Crete: Carob Flour Value Chain, “Central Rethymno”

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Summary

Carob trees are characteristic of the Cretan landscape. Until the 1950s carob pod production was closely related to the socio-economic context of mountainous and semi-mountainous areas in Crete and the pods were used for animal feed and ground into flour for human consumption by many traditional mills. From then on, production has gradually declined, and the trees have been abandoned, in favour of other crops.

Central Rethymno, a semi-mountainous area, has been selected to study carob pod production (reference variable) and ultimately the innovative carob flour value chain, which is based mainly on the endeavours of a local company that processes carob pods to mostly flour. The lengthening of the carob pod value chain during the last decade has revived interest in the cultural impact of carob, as well as in its innovative products and by-products. For these reasons, the carob value chain seems particularly worthy of analysis in the context of Central Rethymno. [MOVING](#)'s outcomes can be generalised and applied throughout the Island of Crete.

Know more about the Crete Reference Region, its selected value chain and the regional multi-actor platform (MAP), [here](#).

Key policy messages

- Envolement
- Participation
- Social innovation
- Academia - Community Partnerships



1. The Mountain Reference Region (MRR)

The Mountain Reference Region (MRR) of Central Rethymno is a hill-mountainous area between the two major massifs of Crete: White Mountains and Psiloritis (Mount Ida). It consists of a typical Cretan landscape, with steep slopes, mainly covered with shrub vegetation, oaks, kermes oaks, carob trees and olive trees. In that landscape are scattered numerous small villages (with less than 500 residents). The dominant land use is permanent extensive and agro-silvo-pastoral systems, deeply connected to the way of life of the inhabitants. The area has a high level of vulnerability, mainly due to population ageing and decline, and the hitherto implemented rural development policies that have led to land and activity abandonment. Climate change is exacerbating the situation. A characteristic example of abandonment is the exploitation of carob trees. The carob tree (*Ceratonia siliqua*) is a species of flowering evergreen tree in the pea family. It grows widely in the arid, semi-mountainous, and rocky terrain of Crete. Carob trees have been self-planted and cultivated for centuries on the island. Carob farming is a non-irrigation, low-intensity and organic endeavour. Carob trees are a drought-resistant and hardy species that has been part of the agroforestry, as well as an economic resource and cultural element, in Crete for hundreds of years.

In times of great need, famine or the turmoil of war, like in WWII, Cretans used carob flour as a substitute for wheat. By that time, production was so high that carob was also exported to northern Greece. After the 1950s pod production declined due to low price yields and during the 1980s many carob trees were logged for firewood. Another very dominant driver of change is the demographic changes that have affected and continue to affect carob pod production. They include an ageing population, migration of the younger generation from villages to the city centers, and abandonment of farming as a profession and a way of life. This driver has led to the neglect of agriculture and the destruction/ abandonment of agricultural land in the MRR. Consequently, the driver has led, and continues to lead, to loss of know-how in grafting, pruning and tree-renewal for the younger generation of farmers. Hence, carob pod production in the region decreased consistently because of the crisis within the traditional agricultural sector and the low economic yields. Many of the traditional mills also closed down or were destroyed.

2. Carob and its value chain

Carob pod harvesting traditionally yielded and continues to yield a complementary revenue for farmers. The legumes or pods are collected by using a traditional process involving rods. They shake the branches to loosen the fruit, which then falls off onto canvas or cloth sheets spread out on the ground beneath the trees.

Traditionally, the legumes were sacked and brought to the mill for sale and processing. They were and continue to be used for fodder for livestock and as a source of flour for human food consumption.



The harvesting of legumes takes place in late summer to early autumn, and was often a collective communal process. The carob harvest has an overlap with the grape harvest, thus the price of the product can be crucial regarding prioritisation.

Approximately a decade ago there was a resurgence in carob processing into flour and other by-products due to their nutritional value. Nowadays, the carob legumes are processed for both human and animal consumption in modern mills with patented techniques for processing the ripe, dried, or toasted legumes into :

- flour and products based on flour (chips, rusks, bread, etc)
- powder as a substitute of coffee, tea and cocoa
- molasses type syrup, and
- beauty products.

Flour is the predominant by-product processed within the MRL. The higher-value carob seeds are extracted, exported by local mills and processed to [tragesol](#) in Italy and other countries, and are ultimately utilised in food and chemical industry.

This high-quality carob flour by-product is in turn used in a long, but rather narrow value chain of baked goods, condiments, snacks, and other flour-based food items.

Due to their nutritional value, lower calories, fat, and processed sugar, the carob flour by-products have been used in the nutraceutical industries and are a part of the sustainable food movement.

3. Value chain contribution to sustainability and resilience of the MRR

The [Creta Carob](#) company is currently the major actor, engaged in cultivation and processing of the carob pods in Central Rethymno. The company has patented a technique for processing carob beans and has enhanced the traditional use of carob, lengthened the value chain, and made sustainable use of the semi-natural forest land in the region. The Creta Carob company has proven the economic value of carob cultivation mostly due to the use of carob flour for traditional flour-based foods and by exporting flour and other products around the world.

The Giakoumakis family [Giakoumakis Farms](#) is yet another agro-business in the MRL. It is successful example of the European afforestation strategy that was implemented in the 1990s which played a significant role in bolstering carob planting in the Rethymno region and drove a renewed interest in carob farming.

Moreover, in the wider area of Rethymno a “Community of Cultivation, Natural and Cultural Use of Carob in Crete- [THE CAROB OF CRETE](#)”. This cultural heritage network aims to bring together carriers of the traditions and knowledge related to the cultivation and the consumption of carob. The Community is supported by scientists and local stakeholders. Additionally, in the



past decade, a growing scientific interest from the academic institutions of Crete for studying and researching carob has flourished. Carob flour's nutritional value and the dynamic growth of the value chain display great economic potential. Moreover, if processing of carob seeds can be accomplished locally to produce gum, further benefits will materialise.

Carob farming/ harvesting abandonment, land use policies, and land fragmentation are the negative driving forces in the sustainability of carob pod production. Policies that support innovations and training in farming and processing practices and that can foster the widespread dissemination of technical knowhow and economic diversification opportunities, such as agri-tourism, rural tourism, energy production, and ecosystem services are essential.

4. Policy relevant considerations

The analysis of the carob value chain allows us to understand the multifunctionality of the carob tree and pod production and processing and its environmental, economic and social role in rural mountainous communities in Central Rethymno. The valorisation and preservation of the carob pod production and processing is important for local economic development, and for the preservation and management of the semi-forest landscape and traditional village life. Further innovation can contribute to the broadening of the carob flour value chain, to increase the production and ultimately to reduce the abandonment of carob cultivation and to improve carob farming practices which have brought a complimentary income to farmers. This will prevent the loss of historical and cultural heritage, and sustain the population in the traditional villages.

The development of a holistic plan with measures to avoid abandonment of the countryside is recommended. The proposed changes include developing effective training programming for farmers and economic diversification in the MRL to retain the younger populations. Diversification proposals included funding for the building of processing plants for carob seeds in the MRL. Recommendations to increase profitable non-agricultural employment opportunities within the MRL while minding environmental degradation and leading to population maintenance were also made. According to the participants, funding or loans for such employment opportunities can enhance sustainability of agricultural production and natural resource use.

Development and transfer of knowledge about carob cultivation is essential as is the support from agricultural directorates, from agronomists regarding cultivation of saplings. Another recommendation is to develop and apply policies that promote the conservation and use of underutilized and neglected crops. Adequate policies, legislation and regulations need to be put in place regarding the exploitation of "forest trees" which includes carob and the land use issues involved in the agro-forestry farming in the MRL.

The need for knowledge about the different species of carob trees, the available cultivars, their reproductive capacities, and the traditional species that are endemic to the MRL that has



recently begun can contribute to the knowledge base of the specific characteristics or the potentialities (strengths and weaknesses) of the local cultivars in order to best cultivate them in the regional climatic conditions and use them in the carob value chain.

Taking advantage of the manufacturing and business paradigm of the Creta Carob Co., the support for community initiatives (CRETE'S CAROB), along with academic interest and the expressed will of the Region of Crete to support carob production, MOVING aims to initiate the revival of carob cultivation and processing. MOVING will enable the construction of a [Multi-Actor Platform](#) (MAP) that will contribute to the sustainability and the resilience of the land use systems, as well as socio-economic activities in Central Rethymno. Furthermore, MOVING's results will be exploitable towards the adoption of good practices and the development of targeted policies for the cultivation and processing of carob pods throughout Crete.

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