



MOVING
MOUNTAIN VALORISATION THROUGH
INTERCONNECTEDNESS AND GREEN GROWTH

Policy Brief

CRETE | Carob Flour VC “Central Rethymno”



Photo credit: Kostis Pigounakis



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Carob Flour VC “Central Rethymno”

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Summary

Central Rethymno, a semi-mountainous region of Crete, (Greece), was selected to study the innovative Carob Flour value chain. The carob tree (*Ceratonia siliqua*) is a species of flowering evergreen tree in the pea family. It is a drought-resistant and hardy species that has traditionally been interplanted in olive groves with low-intensity farming systems in Crete or spread naturally in terrain and its cultivation has been highlighted in the literature for its importance in addressing climate change challenges and contributing as a vital component of environmental sustainability. The environmental, economic & social role of carob pod and flour production & processing in the rural mountainous communities of the MRL is obvious by the growing interest and consumer demand for the products produced. The valorisation & preservation of the carob flour VC is important for the local economic development and for the preservation and management of the semi-forest landscape and traditional village life.

1. Central Rethymno and the Carob Flour Value Chain

Central Rethymno, a semi-mountainous region of Crete, (Greece), was selected to study the innovative Carob Flour value chain (VC). The region of Central Rethymno lies between the two main mountain masses of Crete, Mount Ida or “Psiloritis” (2456m.) and the White Mountains or “Madares” (2453m.), consists a typical landscape of Crete, with steep slopes, mainly covered with shrubby



Figure 1: Carob Flour Value Chain

Key Policy Messages

- ☞ Targeted and tailored policies and interventions for the region’s mountainous communities
- ☞ Equality in welfare, health and educational service provision
- ☞ Incentives for young scientists
- ☞ Support of entrepreneurship

vegetation, oaks, kermes oaks, olive trees and carob trees. Numerous small villages (with less than 500 residents) are scattered around this area where the dominant land use systems are agro-silvo-pastoral, and deeply connected to the traditional way of life of the inhabitants. The value chain (VC) of carob pods and carob flour has historically been important, either for human consumption in low quantities or as a significant part of animal feed.

Carob flour is produced in the semi-mountainous Central Rethymno region of Crete, Greece, and it is used primarily as an ingredient of bakery and pasta products.

Carob flour and other carob products are all sold both nationally and internationally. The expansion of the carob value chain during the last decade has allowed for carob flour to be used as a food ingredient in a range of food products such as baked goods, pasta, dairy drinks, health bars, and dietary supplements and seeds to be exported abroad. The seeds are processed into “locus bean gum” which yields the highest contributor to the carob market due to its exploitation in the food, pharmaceutical and other industries. Pod prices vary greatly and are driven by the more valuable carob seed market. These price increases have valorised interest in carob cultivation.

2. Value chain contribution to resilience and sustainability

The carob tree (*Ceratonia siliqua*) is a species of flowering evergreen tree in the pea family. It is a drought-resistant and hardy species that has traditionally been interplanted in olive groves with low-intensity farming systems in Crete or spread naturally in terrain which is more difficult to cultivate. Carob trees’ cultivation has been highlighted in the literature for its importance in addressing climate change challenges and contributing as a vital component of environmental sustainability. The carob farmers apply “holistic” approaches, which rely on indigenous and traditional knowledge.

Carob has been an important plant for economic, cultural, and social sustainability in the area. In times of great need, famine, occupation and the turmoil of wartime in WWII, Cretans processed carob pods into carob flour as a substitute for wheat and a

source of valuable nutrients. By that time, production was so high that carob was also exported to northern Greece. After the 1960s, the carob production declined precipitously, and since Greece joined the European Union in 1981, the olive oil and olive tree subsidies led to intensive olive monocultures that replaced large numbers of carob trees and ultimately transformed the diverse land use mosaics, creating today’s less diverse agroecosystems and turning Carob into a socially and economically undervalued crop.

Carob flour is now used in traditional “Cretan diet” recipes and re-emergence as a “superfood” for a sector of local and national bakeries, confectioners, contributing to the production of a long, yet narrow, chain of carob-based products. The bakery and confectionery products are valorised by Crete’s tourism and hospitality industries (ELSTAT). Carob flour and other carob products are sold in supermarkets and health food stores all over Crete and in large cities in Greece and they are also marketed via ecommerce. The food industry plays a fundamental role in Crete’s economy and the country’s manufacturing industries and can retain its role as a key growth driver in the MRL, MRR and the country.

The environmental, economic and social role of carob pod and flour production and processing in the rural mountainous communities of the MRL is obvious by the growing interest and consumer demand for the products produced. The valorisation and preservation of the carob flour value chain is important for the local economic development and for the preservation and management of the semi-forest landscape and traditional village life.

3. Policy experiences

Greece's policy regime is lacking in targeted policies for mountain areas and mountain value chains, at national or local level. On the contrary, there are many financial tools for mountainous regions and local self-government in Greece. It becomes necessary to distinguish mountain municipalities to mountain areas, as the latest must be treated differently due to the different challenges they face. Policies that have been applied or could be applied in mountainous VCs are mentioned below:

- **The Common Agricultural Policy (CAP):** The Ministry of Agriculture's Implementation of a program within the European Reg. **2080/92 and 1257/99 for Forestry Guidelines in Agriculture.** The program "*was not effective as an afforestation effort*" according to extension officers in the MRL, but several stakeholders planted large numbers of carob trees under the auspices of this subsidised afforestation program and renewed their production capacity. Currently there are no measures in place for those motivated to plant forest species, as carob trees.
- **Agritourism (LEADER programs** - it is possible to grant Community aid in the form of integrated subsidies to enable local groups to implement the measures listed. Local groups are selected by the Member States and by the Commission of the European Communities)
- **Allowance for residents of mountainous and disadvantaged areas** is granted as part of social protection measures for vulnerable groups to support families with low

incomes. prevent the risk of entire villages located in mountainous and disadvantaged areas being deserted. The characterization of areas as mountainous or disadvantaged is provided for by EU law and is based on European Union directives.

- **Greek Agricultural Organisation** ELGO-DIMITRA implements targeted agricultural vocational training programs concerning new farmers / beekeepers, and certification on the reasonable use of pesticides. There is strong concern about the demise of agricultural cooperatives in Crete and the need for farmers to seek and pay for scientific support.
- "*Agri-food tradition of carob in Crete*" was inscribed in the **National Inventory of Intangible Cultural Heritage** in 2019-Convention for the Protection of the Intangible Cultural Heritage. "*Celebrations*": the "*Carob Festival in the Kato Pines of Elounda*", the "*Cretan Food Festival*" in Rethymno, the Pancretan Cheese and Grass Festival in the province of Mylopotamos, **promote the Cretan tradition and Cretan food.**
- **PDO, PGI, TSG** registered products, governed by Regulation (EU) 1151/2012 "on the quality systems of agricultural products and foodstuffs". At the same time, other quality schemes have been added to this regulation, such as the optional indications "Product of mountain production", "Product of island agriculture", etc.
- **Agronutritional cooperation of Region of Crete**, a Non-Profit Company with the purpose of highlighting and promoting quality products which are produced

within Crete's region and a part of the broader operational and strategic project of the Region of Crete "**Basket of Agricultural Products**". The Partnership's field of activity focuses on connecting the primary and secondary sectors with the tourism sector by the brand "**Crete-Land of Values**" and the "**Cretan Gastronomy Center**".

- **Regional investment in scientific capital** has led to research exploring the varieties / genotypes of Cretan carob, their production capacities, and how they can be utilized in food production industries. Producers, processors, and consumers develop specific knowledge about the dietary, nutritional, and nutraceutical properties of the VC-A and produce high-quality products and byproducts.
- **There is great fragmentation of legislation on land registry** (cadastral) processes, land use and forestry legislation.
- In order to address the issue of labour shortage and demographic changes in Greece 167,925 resident permits were issued to people of other countries between 2023 and 2024 (14,740 permits for the Region of Crete).

4. *Recommendation for future policies*

- The particularities of the mountainous areas must be taken into consideration in every national and european policy. The same values in terms of welfare, education, health, and employment must

exist in mountainous areas as in the rest part of the country.

- Targeted policies for mountain areas. Regional policies adapted to agricultural products and practices. Translation of EU policies to fit the local context of the region.
- The creation of an observatory of mountainous regions as well as the creation of a "General Secretariat" or "a deputy ministry of mountain policy" is imperative.
- The creation of a "Mountain Fund" that will operate at all levels that can be bolstered through tourism to enable the development of ecotourism and sustainable tourism practices. Regional policies must invest in alternative tourism models and in local production and processing by supporting alternative forms of tourism such as ecotourism and agrotourism and encourage the interconnection of economic activities (tourism, agriculture, livestock, etc.) and the promotion of regional goods.
- The important role of continuous education and training of the mountain areas inhabitants is highlighted with an emphasis on the implementation of targeted interventions responding to their real needs. There is a significant shortfall in up-to-date skills and competences and this needs to be addressed more methodically via the provision public adult education services. The improvement of the educational level of the inhabitants and the continuous improvement of their work profiles is integral for the development of the inhabitants of the mountainous areas.

- Need to change EU subsidies and how they are applied (because of dependence of local farmers on EU agricultural subsidies). Reshaping subsidy regimes and continuous monitoring of agricultural policies. Regional offices must update and implement policies.
 - Necessity to create a “toolbox of incentives” for the mountainous areas. Incentives must be given to the mountainous areas inhabitants or to those who choose to stay in mountainous areas (e.g. teachers, medical personnel, etc.). To give opportunities and work possibilities to young people to practice what they have studied in the mountain areas where they come from and want to stay.
 - Strengthening producers and women's entrepreneurship in mountainous areas
 - Support the creation of cultural associations and environmental groups in mountainous areas. Creating collective spaces and dedicated community clubs and promoting cultural groups that can act as intermediaries between local communities and bureaucratic institutions.
 - Strengthening the informal circular economy that was part of the traditional way of life and promoting the mountain identity of the Cretan people. To re-establish the "simisia" and other cooperation procedures for small farmers, so that the harvesting of carob and olives are once again cooperative and communal activities
 - The creation of an active network of mountainous regions throughout Greece
- for the joint promotion of issues while concomitantly respecting the diversity of each mountainous region.
- Accessibility is a key factor for the development of mountainous areas. The state must support the transportation needs of the residents in mountainous regions.
 - Promoting decentralized decision-making processes and empowering local communities. Creating more horizontal, decentralized decision-making processes at regional and local level, enabling local communities to make decisions that affect their way of life (e.g. installing renewable energy sources in mountainous areas). regional policies that can address climate change and alternatives such as carbon sequestration.
 - Energy policy should allow local context-aware regional authorities to manage their resources and decide on economic development projects and renewable energy projects, etc.
 - Focus on the quality and not the quantity of Cretan products. Food policy: accessible policies that grant PDO/PGI certification to Cretan products and capitalize on their wider use and economic benefits.
 - Spatial planning policy. Completion of the cadastral (cadastre) procedures, land use and forest legislation. There is a need to maintain and build infrastructure and increase accessibility in mountainous areas (Schools and educational centres, health care facilities and community centres).

Reference

BLACKSTOCK, K., FLANIGAN, S., CREANEY, R., MATTHEWS K., HOPKINS, J., MILLER, D., AHMED, A., CHABDU, A., BACIGALUPO, A., THOMPSON, C., 2022. D4.3: Participatory value chain analysis. MOVING

TRILIVA, S., PIGOUNAKIS, K., VAVVOS, A., KAFKALAS, J., PITERIS, C. & SKRAPALIORI, K. 2022. *Extended Value Chain Analysis for Carob flour value chain in Rethymno, Greece: Crete, Greece.* MOVING

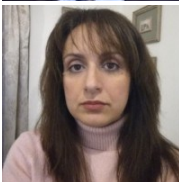
VAVVOS A., TRILIVA S. 2023. *Participatory Foresight Exercise – Central Rethymno 2050.* MOVING

VAVVOS, A., KAFKALAS, I., PITERIS, CN., SKRAPALIORI, K. 2024. *Climate Change and the Role of Governance in the Value Chain Sustainability of Carob Flour in Rethymno, Crete, Greece.* In: MATTAS, K., BAOURAKIS, G., ZOPOUNIDIS, C., STABOULIS, C. (eds) *Value Chain Dynamics in a Biodiverse Environment. Cooperative Management.* Springer, Cham. https://doi.org/10.1007/978-3-031-49845-9_8

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