Università Iuav
di Venezia

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The logistics system of flowers and olives, across ports, highways, and railways

Presented by
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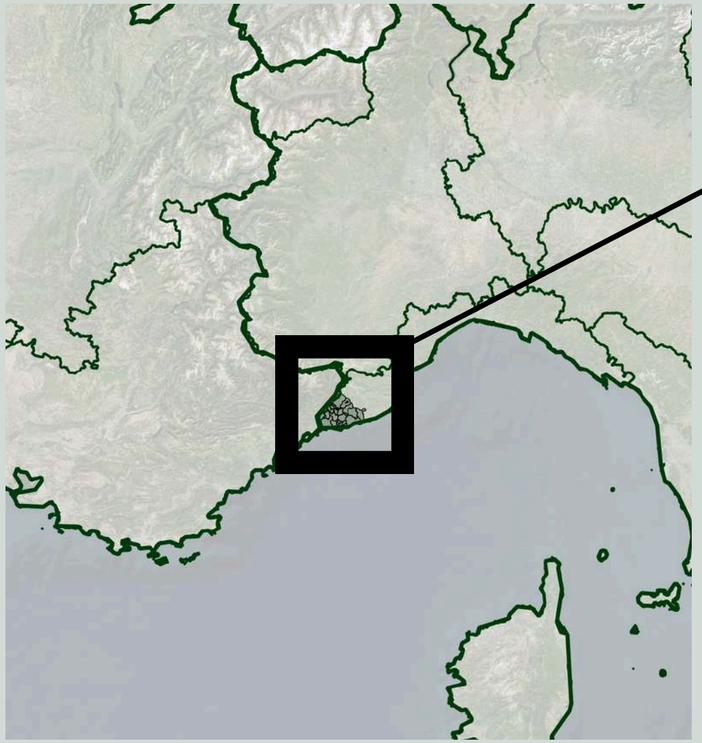
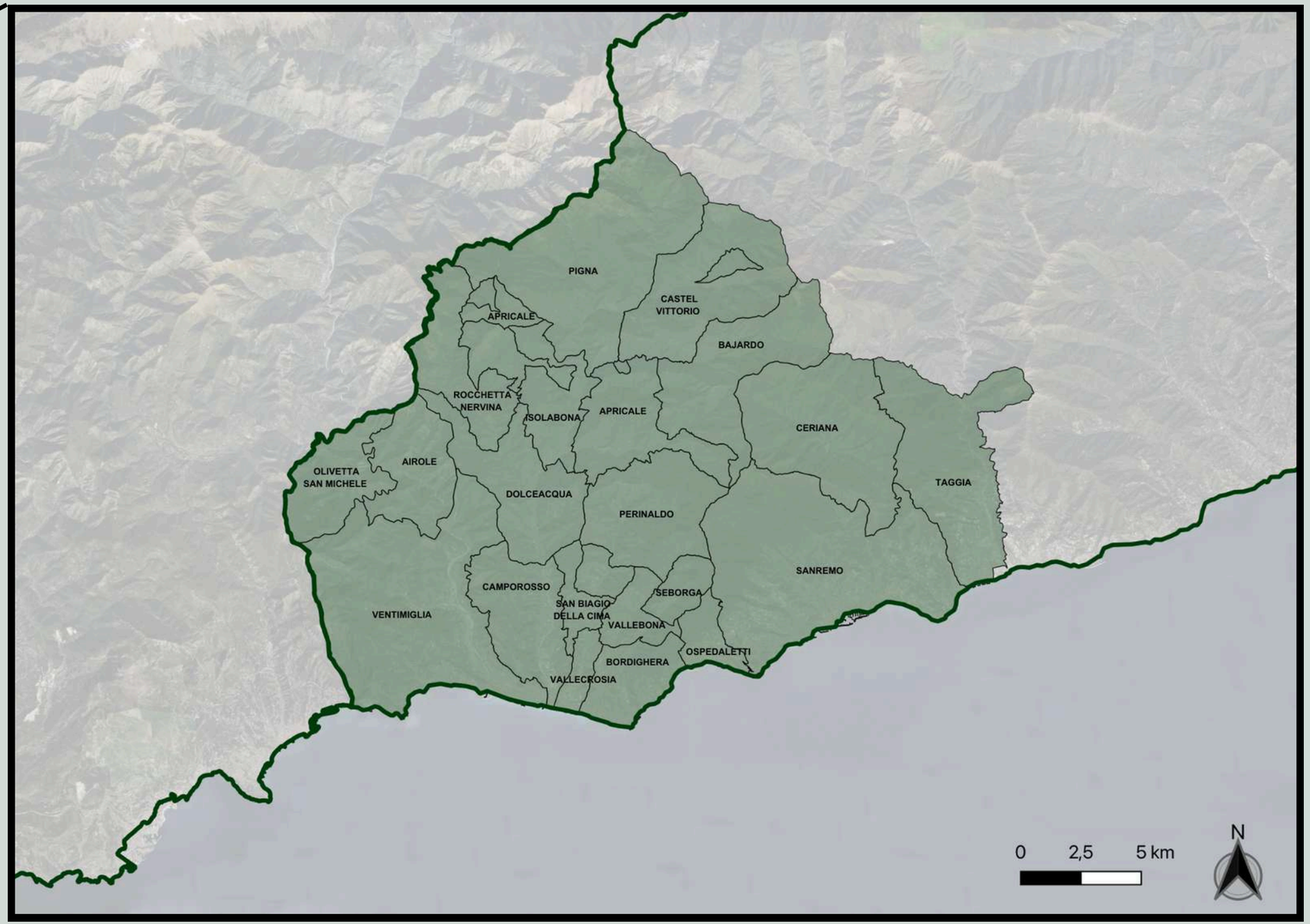
Diagnostic and Exploratory Phase

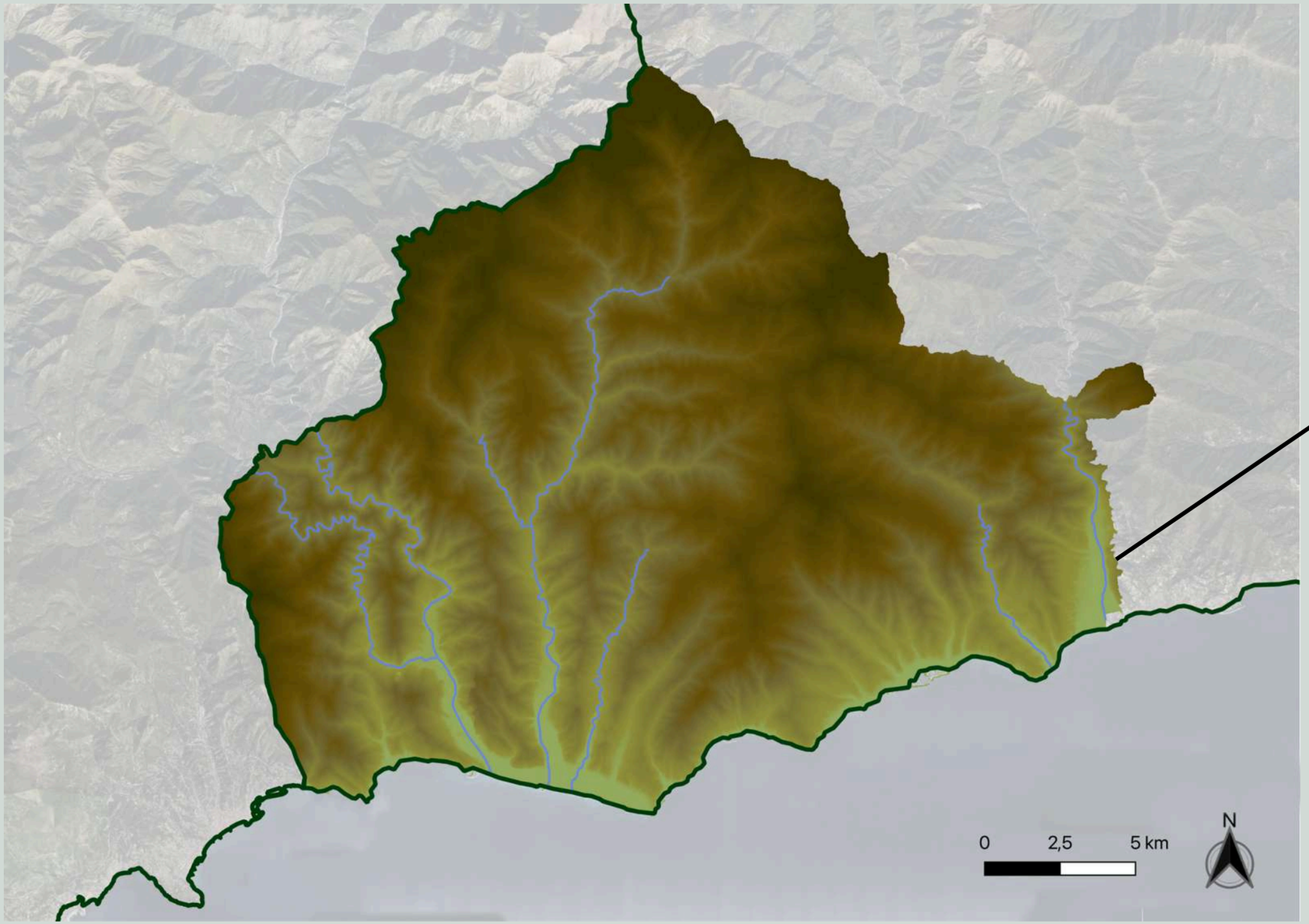
Territorial context



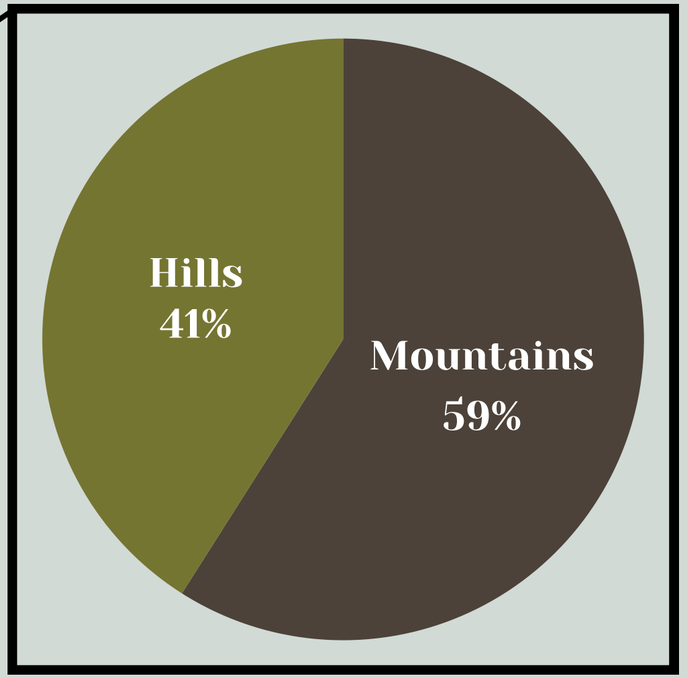


22 municipalities of the province of Imperia, in the Liguria region, in the north-west of Italy, near the border with France.

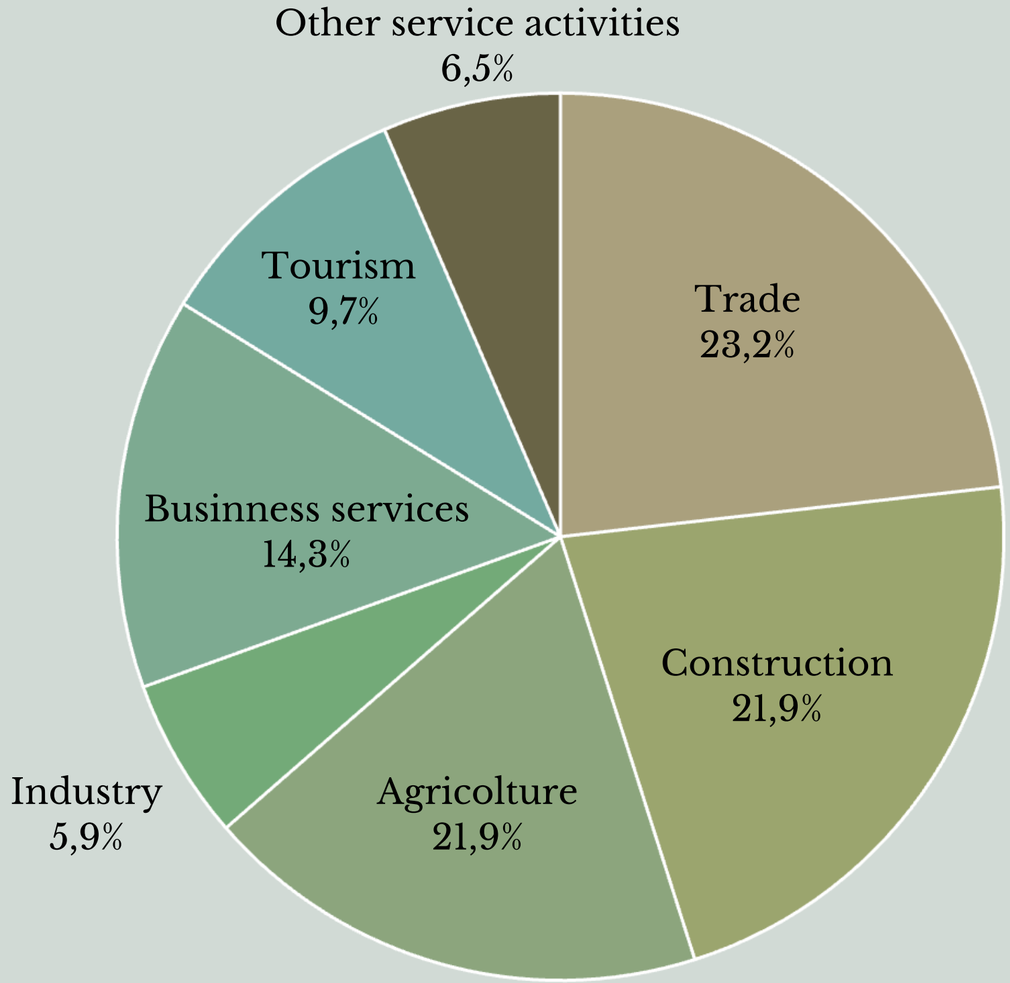
Geomorphology



The area is mainly made up of hills and mountains, with only a few limited plains near the coast, where the major towns and transport infrastructure are concentrated.



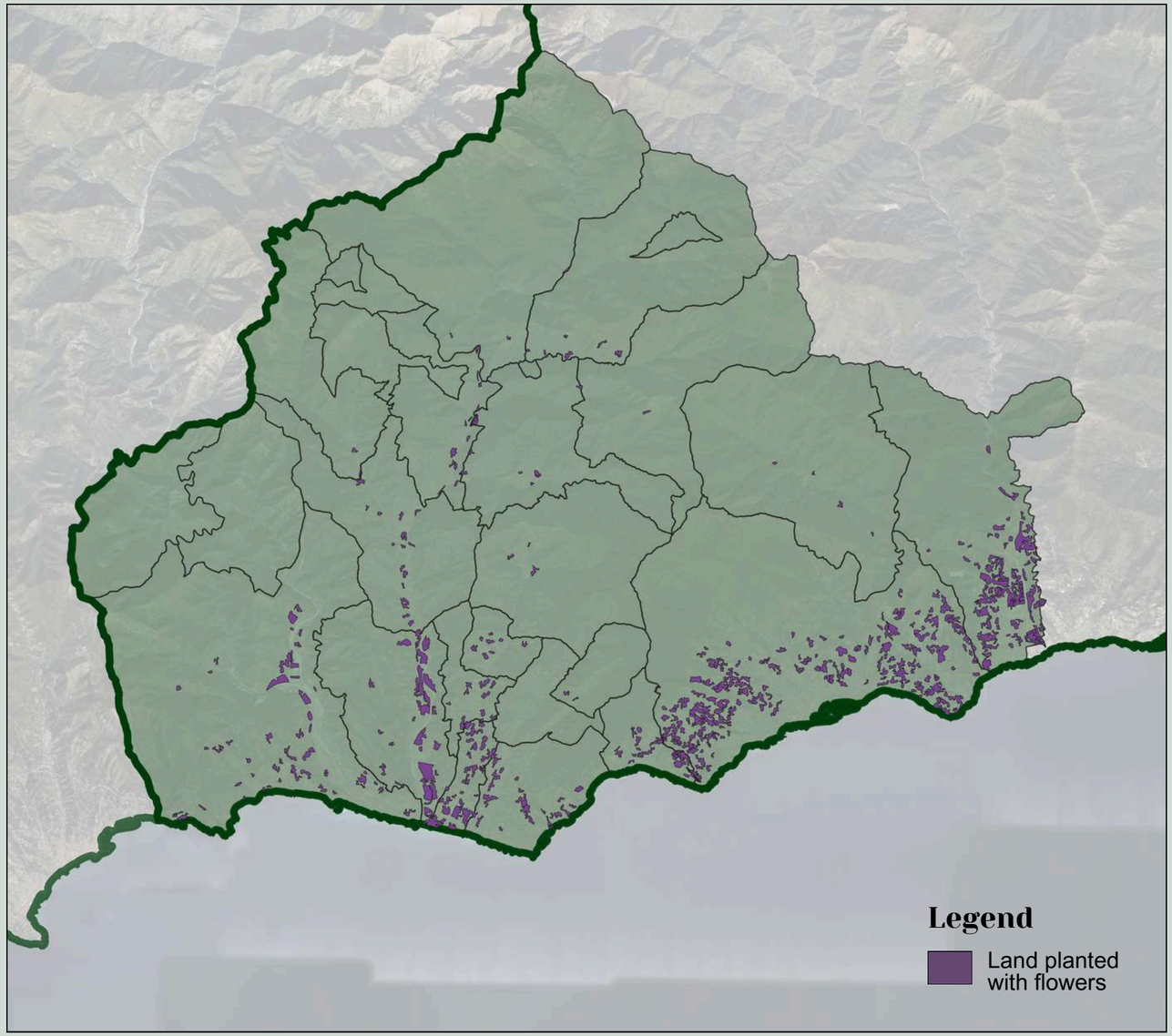
An introduction to the agricolture of the province



As we can see from these data, the agricultural sector, which includes floriculture and olive growing activities, is a sector of fundamental importance for the economy of the province of Imperia.

The floriculture industry

Characteristics of the sector



Most of the plant nurseries are concentrated along the coastal strip:

- favorable climate that allows production even in winter
- strategic location for trade, supplying national and international markets year-round.

This sector requires:

- highly specialized logistics system
- organizational coordination
- short timeframes due to the perishability of the product.

Strengths in the floriculture supply chain

- **Floriculturists, by using direct sales, have the opportunity to manage transportation independently, adapting it to their needs and schedules.**

- **Floriculturists relying on sales at the Sanremo Wholesale Market can count on an efficient logistical structure that optimizes load management and rationalization, aggregating goods from various producers towards their final destinations.**

- **Regardless of the sales method, local transport companies are highly organized and specialized in flower transportation, ensuring efficiency in distribution and managing the specific needs of the product.**

Weakness in the floriculture supply chain

- Floriculturists, by using direct sales, must independently manage the logistics supply chain, facing a significant economic and organizational commitment.

- Floriculturists, by using direct sales, do not coordinate load management with other producers heading to the same destinations, creating inefficiencies in the distribution process, increasing costs, and leading to suboptimal use of resources.

- Given the perishable nature of the goods, the logistics supply chain must be managed with speed and efficiency, adopting transportation and storage techniques capable of preserving the integrity and quality of the product.

Opportunities in the floriculture supply chain

- Given the presence of a well-established floricultural district, it would be possible to promote a more efficient logistical planning of the routes currently managed independently by the producers, specifically those related to direct sales, in order to aggregate shipments, reduce costs, and optimize logistics processes.

- The adoption of technologies that connect producers and transport carriers would enable the optimization of the match between supply and demand, aggregating goods heading to the same destination, improving transportation efficiency, and simultaneously reducing inefficiencies in the logistical process.

Threats in the floriculture supply chain

- Being tied to tradition, producers may be reluctant to adopt new logistical and technological solutions, as well as to collaborate with one another.

- Local transport companies, accustomed to managing spot freight and treating each shipment as an isolated case, may not immediately possess the expertise to strategically optimize goods flows.

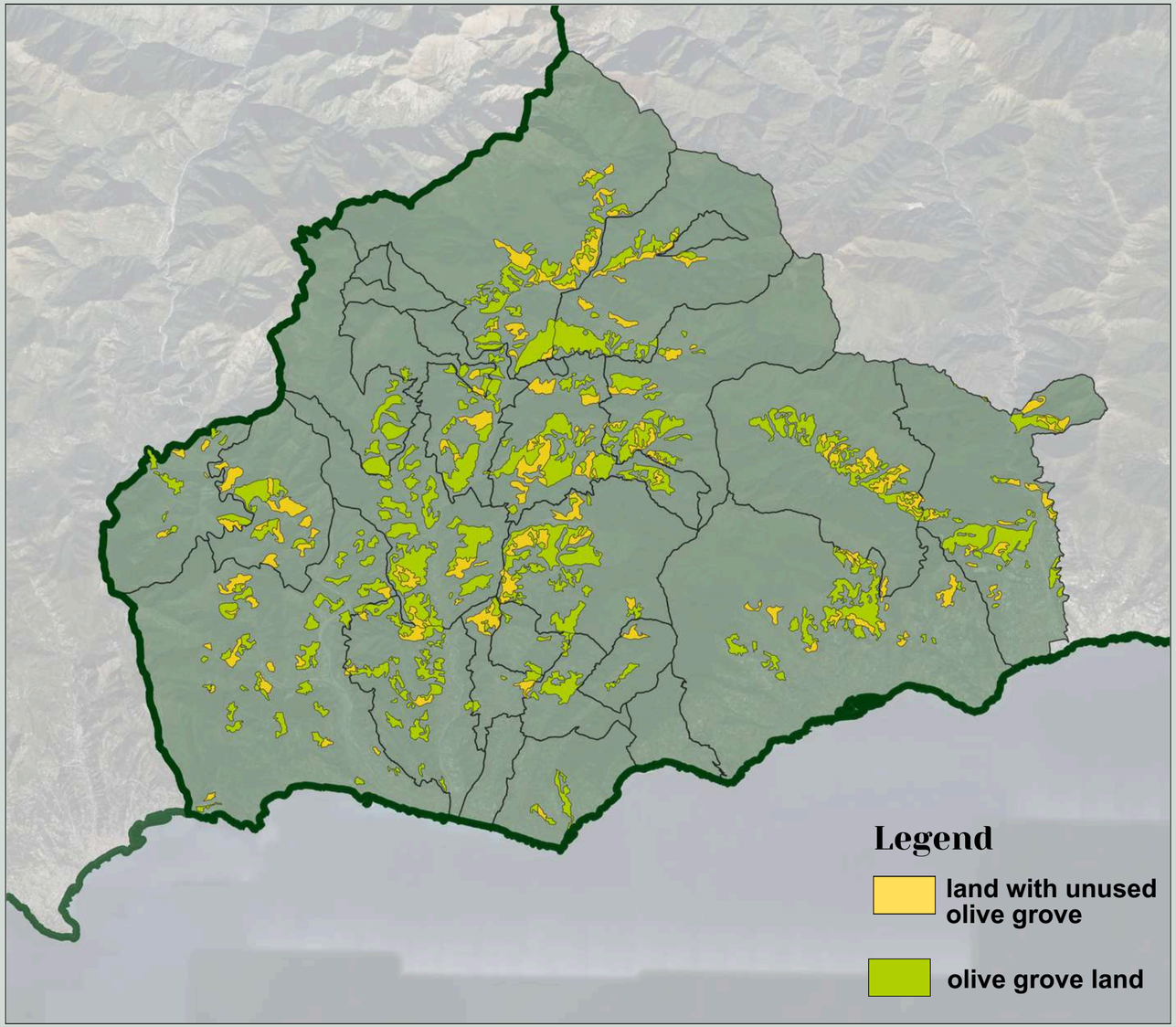
The olive industry

Characteristics of the sector

- In the study area, in 2024 olive groves cover 13,449 hectares

- Most of the olive groves are in the valleys, where infrastructure is less developed, limiting access and transport.

- Over 94% of the olives harvested of the study area are destined for oil production. This requires significant transport to mills for processing before bottling and final distribution.



Strengths in the olive supply chain

- The distribution of olive groves along the valleys results in a linear arrangement of production areas.
- The concentration of mills in the district around the city of Imperia allows for greater logistical efficiency.
- By personally managing transportation, producers can ensure the quality of the product throughout the entire supply chain.
- The durability of olive oil allows for a slower and more flexible logistics process, as the final product can be stored for extended periods without compromising quality.

Weakness in the olive supply chain

- The management of the logistics chain represents an economic and organizational commitment for individual producers.
- The lack of coordination and consolidation points leads to less load optimization and low supply chain efficiency.
- Raw products awaiting oil transformation are perishable and therefore require a swift logistics process under optimal and controlled conditions.
- The olive harvesting areas are generally far from the mills where the transformation into oil takes place.

Opportunities in the olive supply chain

- Possibilities for individual producers to organize into cooperatives or consortia, fostering the sharing of resources, expertise, transportation means, and infrastructure.

- Given the concentration of olive groves along the valleys, it would be possible to optimize the planning of collection routes to the mills through an aggregated transportation system.

- Potential to create decoupling points where products from multiple producers can be stored and delivered in aggregated shipments, optimizing the logistics process.

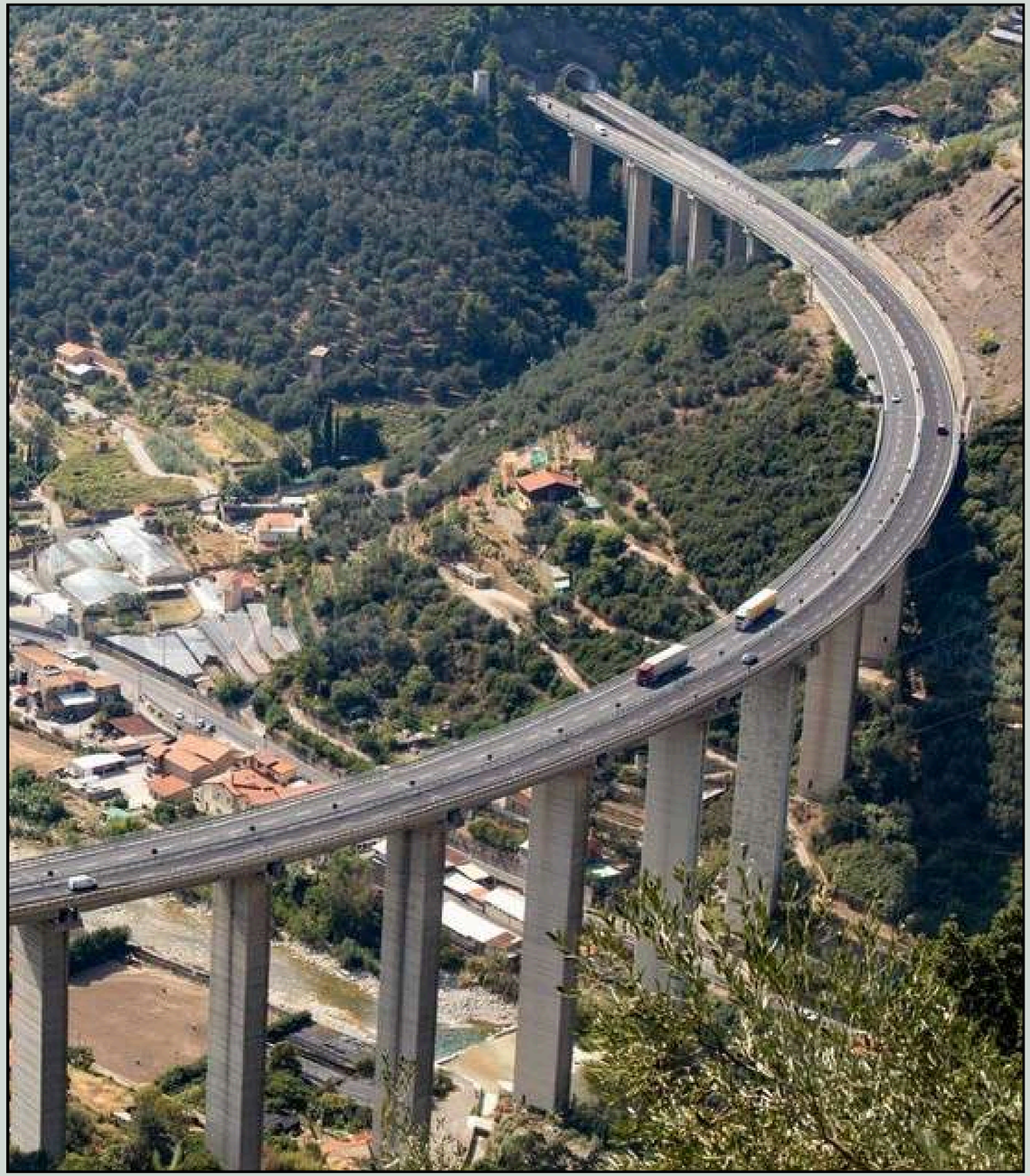
Threats in the olive supply chain

- High production variability, caused by climatic conditions, pests, or diseases, leads to fluctuating transportation demand from year to year.

- Introducing new technologies and infrastructures requires significant investments, often unaffordable for small producers without support or incentives.

- Rooted in tradition, small producers may resist adopting new logistical solutions and collaborating with each other.

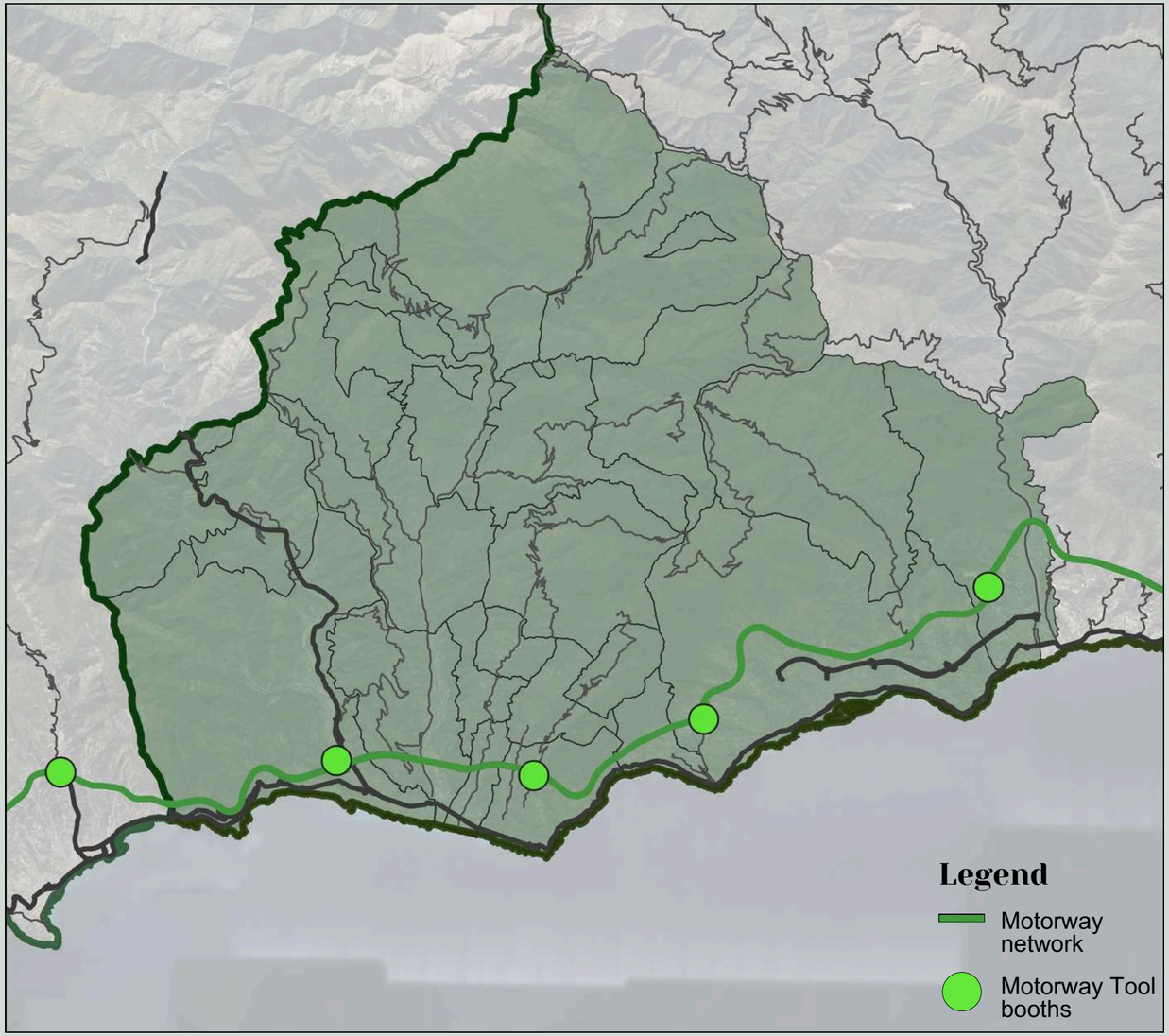
Trasnportation supply



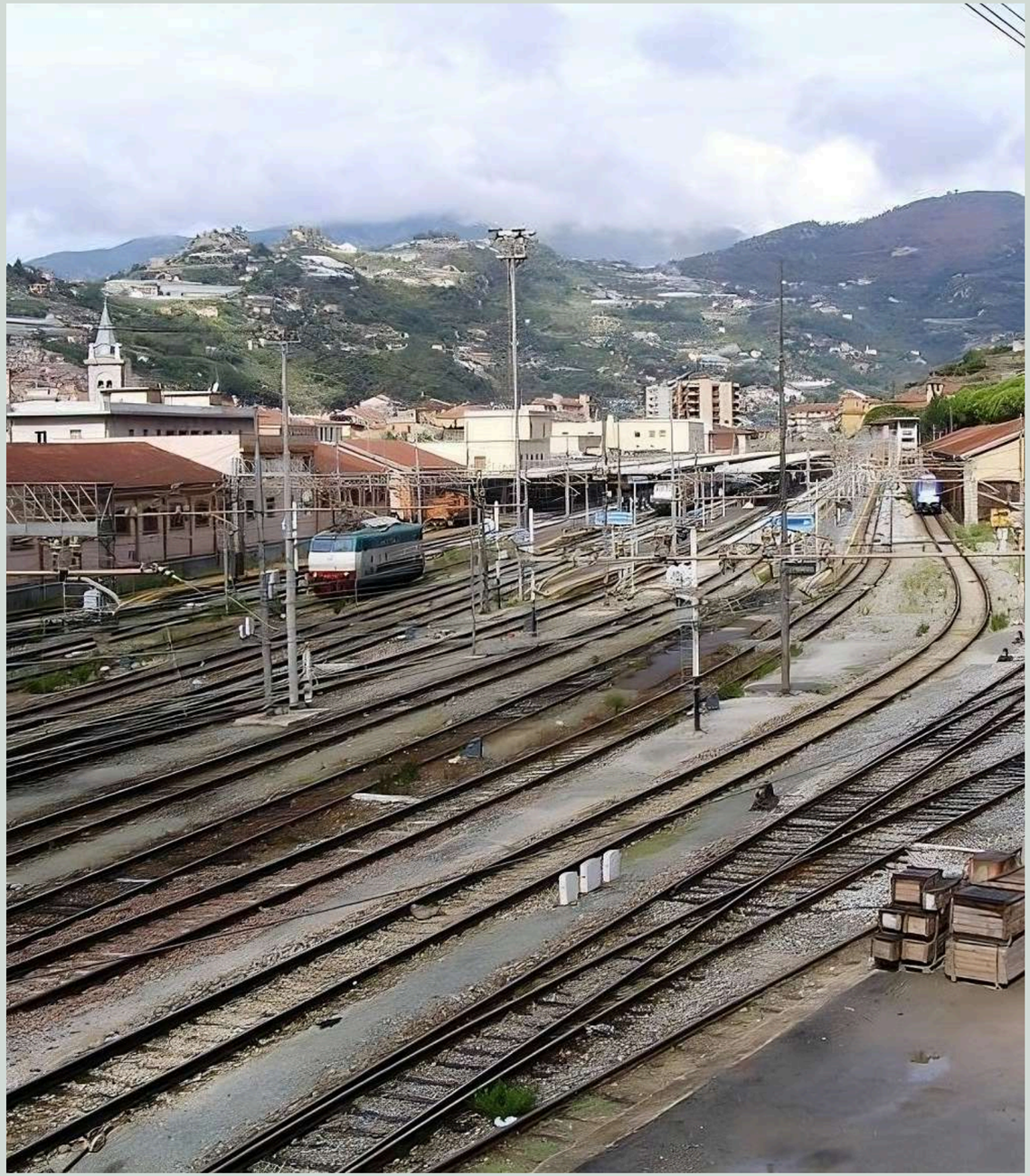
1. Road network

The area is characterized by the presence of a major motorway, the A10, also known as the “Autostrada dei Fiori” (Highway of Flowers), which connects Genoa to Ventimiglia and extends beyond the French border, where it is known as Autoroute 8. It continues towards Nice and all the way to Aix-en-Provence. These two infrastructures are part of the larger European road system, the E80.

The map of the road network



As shown on the map, in the study area the main arteries are concentrated in the region closest to the coast, primarily developing in an east-west direction. The valleys to the north of the territory, on the other hand, are characterized by a less dense road network, with communication routes mainly oriented in a south-north direction, following the courses of rivers and the main natural passageways.



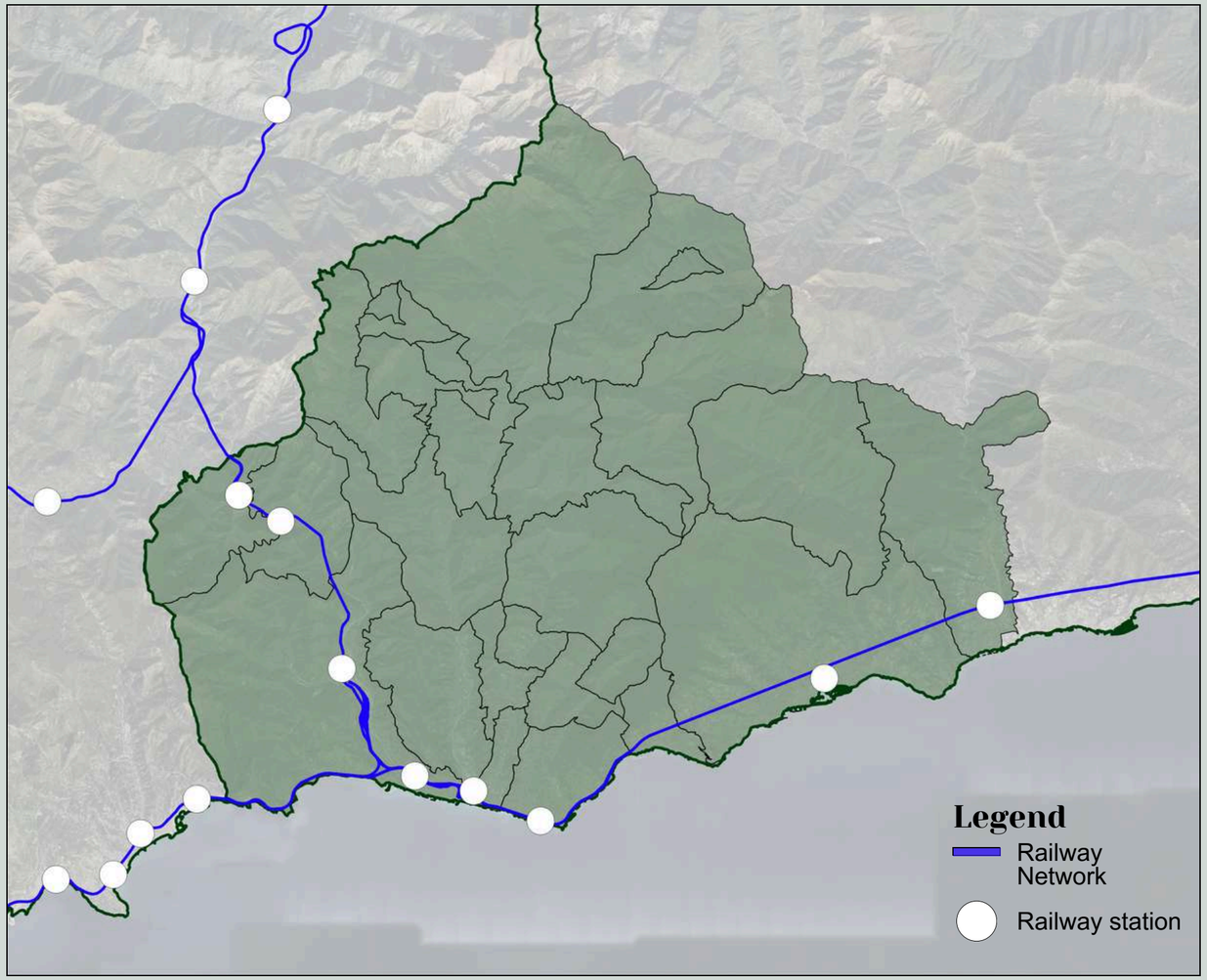
2. Railway network

The railway lines present in the study area are three:

- **Ventimiglia-Genoa,**
- **Ventimiglia-Nice-Marseille,**
- **Ventimiglia-Cuneo**

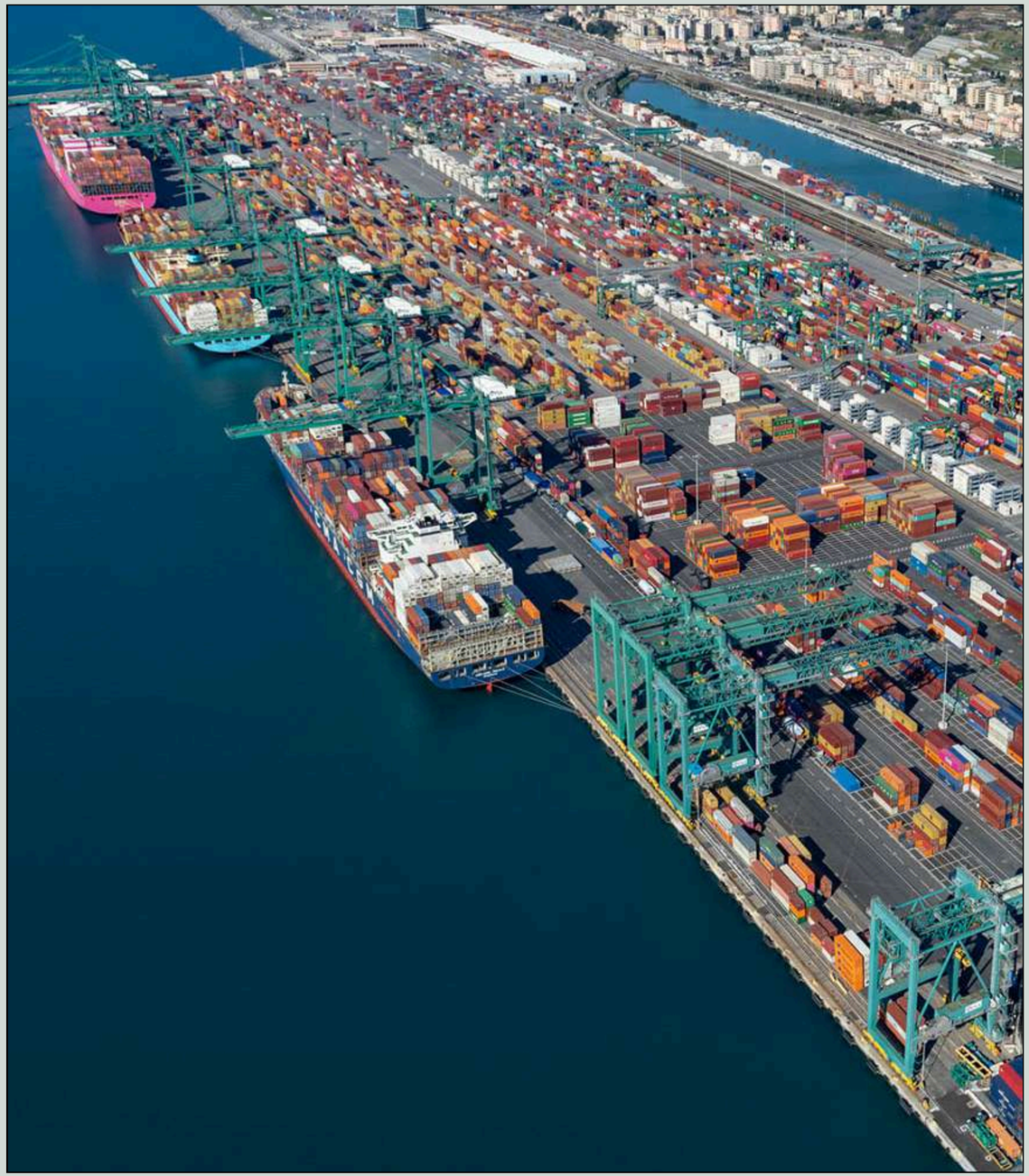
At the heart of the railway network in the study area is the Ventimiglia station, which serves as a key hub for connections between the different lines.

The map of the railway network



There are several passenger stations in the study area, but currently, there are no intermodal freight terminals (train-to-road) , which limits the integration of different transport modes for the freight sector.

Moreover, the existing railway lines should be enhanced and improved to enable better connectivity both on the Italian and French sides.



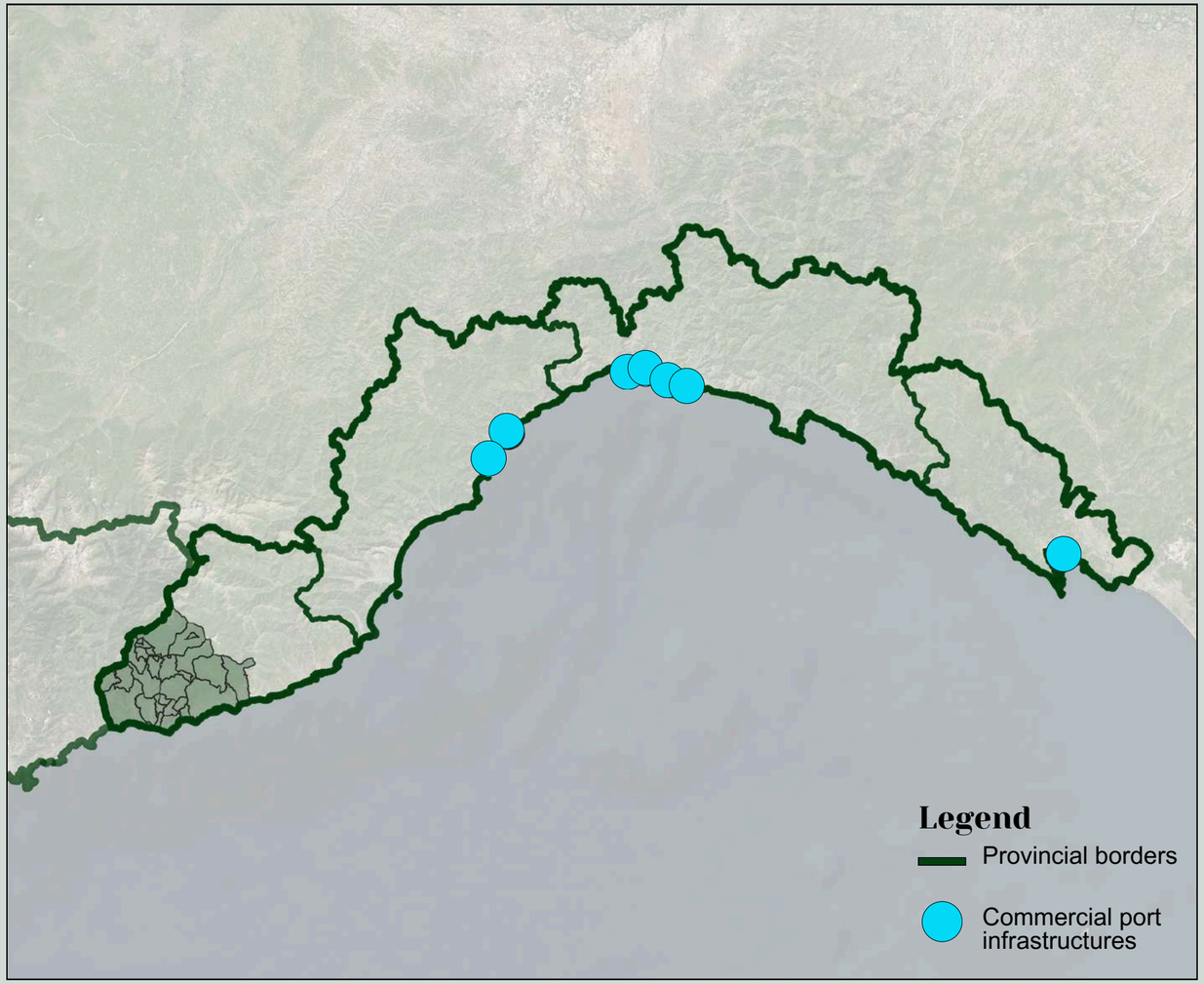
3. Port Network

The Ligurian commercial ports are:

- Savona
- Genoa
- La Spezia

All three infrastructures are well connected to the rest of the region, both through road and rail networks.

The map of the port network



Although there are no commercial ports within the study area, the presence of a regional network of commercial ports represents a great potential for the Ligurian logistics system, as it offers numerous opportunities for economic development, even at the international level.

4. Airport Network

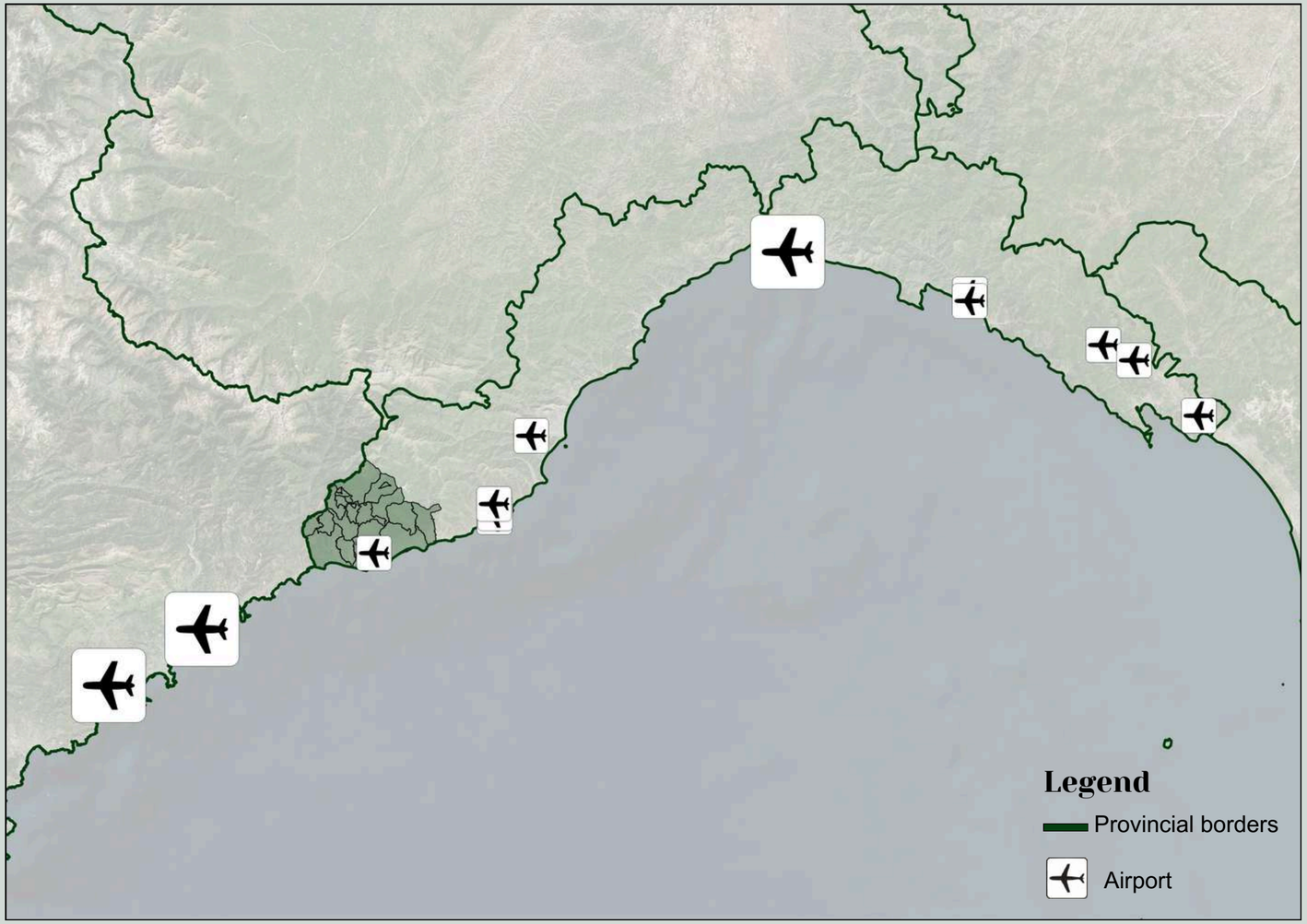
The main airport of Liguria is located in:

- **Genoa**

The region has other smaller airports, but they do not handle cargo traffic. However, due to its proximity, it's important to mention the nearby French airports of:

- **Nice**
- **Cannes**

The map of the airport network



Although there are no airport infrastructures capable of handling freight traffic within the study area, the good connection with Italian and French airports still ensures efficient access to air freight transport, facilitating international connections.

Project Phase

Olive sector

Floriculture industry

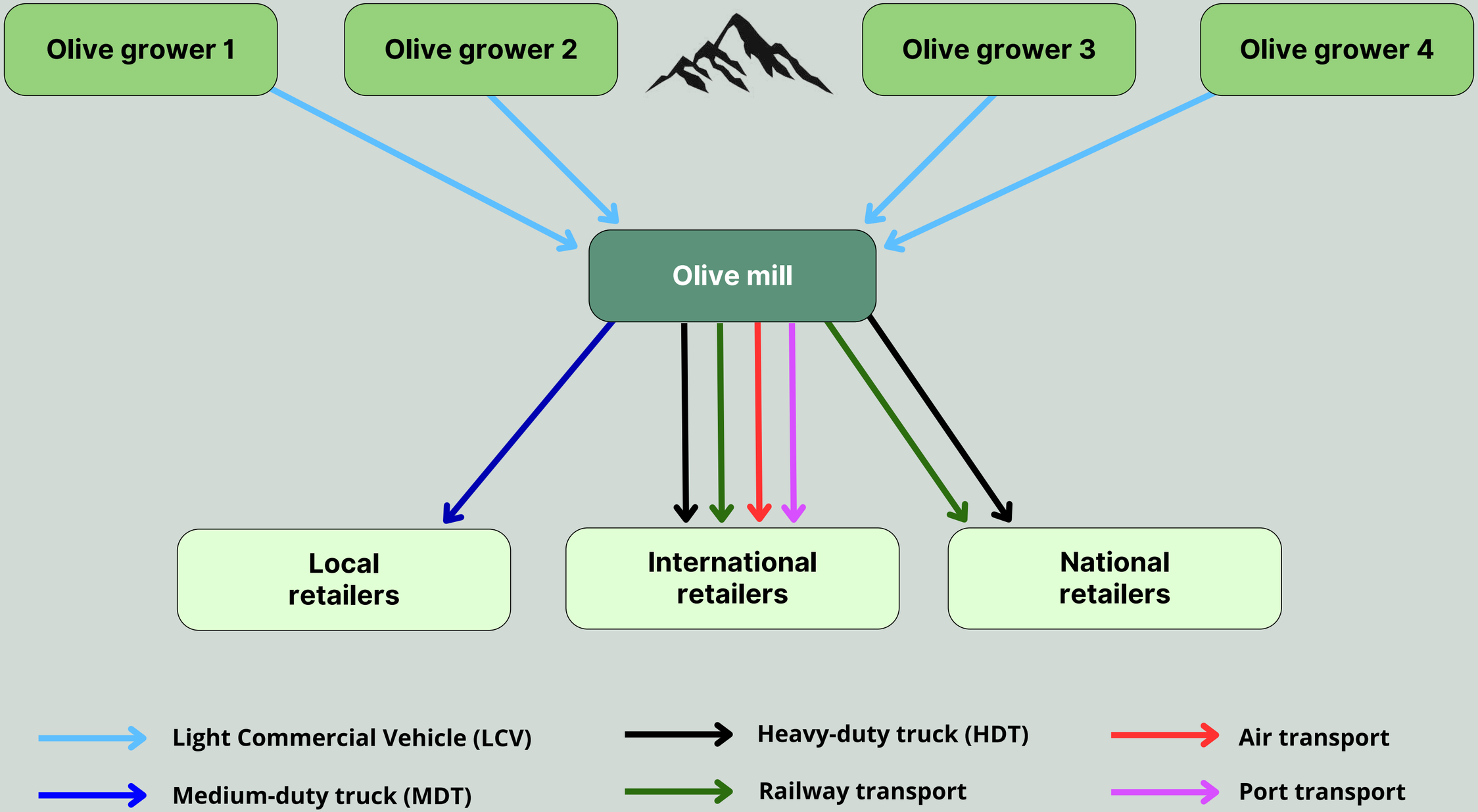
These are two distinct economic sectors, each characterized by different products and specific logistical needs

Consequently, two distinct transportation projects have been designed for the two sectors.

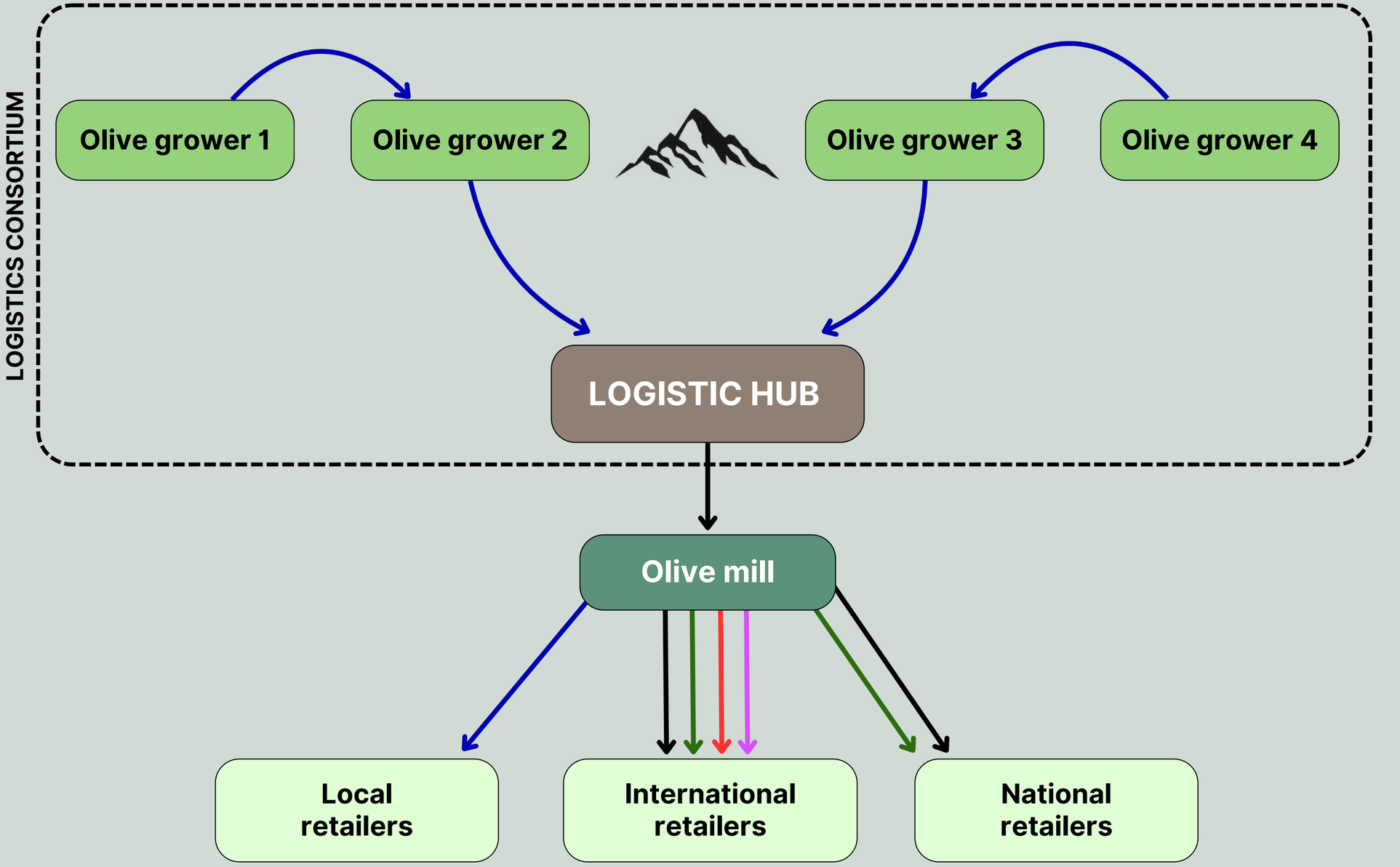
A new logistics system managed by a consortium for olives, utilizing vehicles of varying sizes and a consolidation hub for goods.

A platform for aggregating products destined for the same destination for flowers, capable of matching supply and demand.

Current state of the olive sector's logistics supply chain


Olive grower 1
Olive grower 2
Olive grower 3
Olive grower 4
Olive mill
Local retailers
International retailers
National retailers
Light Commercial Vehicle (LCV)
Medium-duty truck (MDT)
Heavy-duty truck (HDT)
Railway transport
Air transport
Port transport

Proposed logistics supply chain for the olive sector


LOGISTICS CONSORTIUM
Olive grower 1
Olive grower 2
Olive grower 3
Olive grower 4
LOGISTIC HUB
Olive mill
Local retailers
International retailers
National retailers
Light Commercial Vehicle (LCV)
Medium-duty truck (MDT)
Heavy-duty truck (HDT)
Railway transport
Air transport
Port transport

Proposed logistics supply chain for the olive sector

The project aims to optimize the olive supply chain by connecting harvesting areas to regional mills, primarily located in Imperia. Centralized logistics will be managed through a consortium uniting local olive growers. The supply chain will have two phases: the first involves transporting olives from farms to a strategically located consolidation hub owned by the consortium; the second focuses on transferring olives from the hub to the mills, ensuring efficiency and streamlined operations.

Proposed logistics supply chain for the olive sector

The initial transport phase, from production areas to the consolidation hub, will be managed by the consortium using medium-sized vehicles, ideal for navigating the hilly and mountainous terrain. The consortium will implement an optimized routing system to efficiently plan vehicle routes, ensuring streamlined olive collection from farms. Routes will minimize travel distances and maximize vehicle loads by consolidating harvests to full capacity.

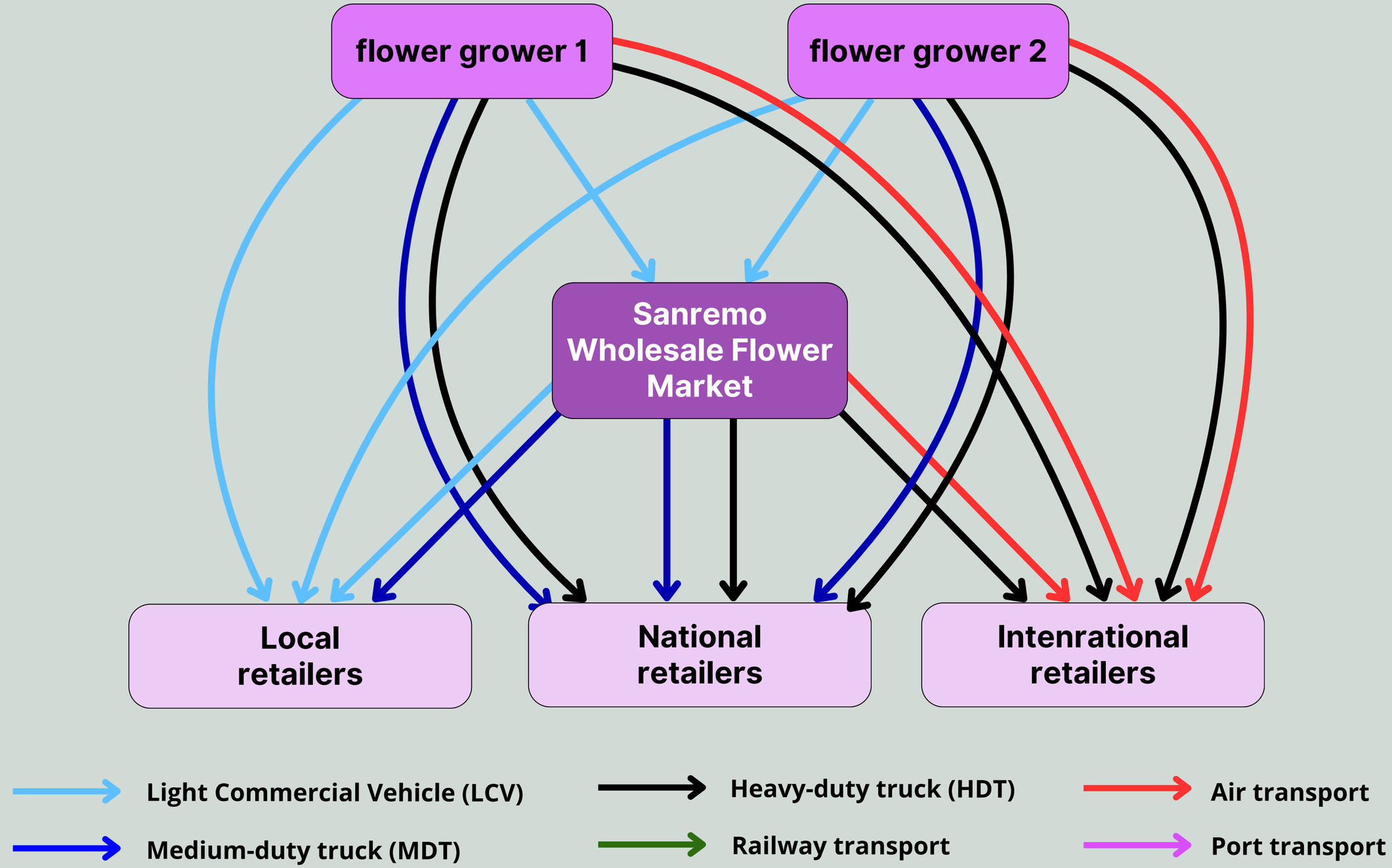
Proposed logistics supply chain for the olive sector

The second phase, also managed by the consortium, will involve the transfer of olives from the consolidation hub to the mill. For this operation, large road vehicles will be used to maximize loads and further reduce the number of necessary trips, thus optimizing the overall logistics process and improving the efficiency of the supply chain.

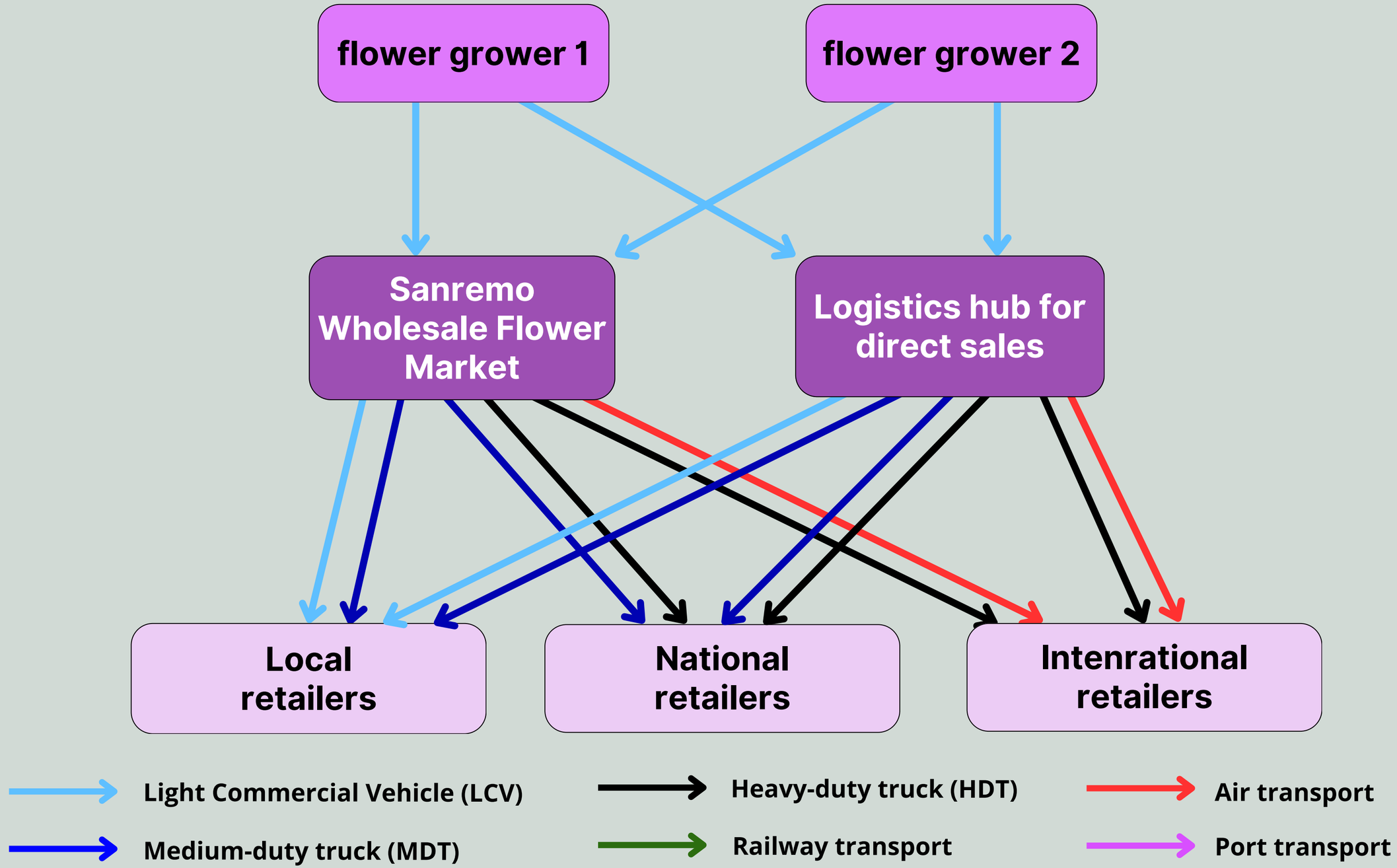
Proposed logistics supply chain for the olive sector

The designed transportation system increases olive transportation efficiency from the study area and can serve as a replicable model in other production regions, like the Levante Ligurian Riviera. With strategically placed hubs, the modular approach adapts to each context, improving transport management, reducing trips, and optimizing resources across the olive supply chain.

Current state of the logistics supply chain in the floricolture industry


flower grower 1
flower grower 2
Sanremo Wholesale Flower Market
Local retailers
National retailers
Intenrational retailers
Light Commercial Vehicle (LCV)
Medium-duty truck (MDT)
Heavy-duty truck (HDT)
Railway transport
Air transport
Port transport

Proposed logistics supply chain for the floricolture industry


flower grower 1
flower grower 2
Sanremo Wholesale Flower Market
Logistics hub for direct sales
Local retailers
National retailers
Intenrational retailers
Light Commercial Vehicle (LCV)
Medium-duty truck (MDT)
Heavy-duty truck (HDT)
Railway transport
Air transport
Port transport

Proposed logistics supply chain for the floricolture industry

The core idea of the project is to overcome the current fragmented management, where each company uses its own small vehicles, by implementing a new system that can consolidate the transportation demand of producers and match it with the transportation supply provided by local logistics companies, which are already equipped with the necessary vehicles and technologies to handle the transportation of large quantities of flowers.

Proposed logistics supply chain for the floricolture industry

At the core of this optimization is a digital platform designed to connect the aggregated transportation demand of producers with the supply of specialized logistics services. The platform enables producers in need of transportation to seamlessly link with local logistics companies offering the required services, creating mutual benefits for both parties by streamlining the process and improving efficiency.

Proposed logistics supply chain for the floricolture industry

The transportation company managing the aggregated shipment uses an advanced planning system. On the scheduled shipping day, the system plans the most efficient route for the transport vehicle, considering all flower growers who have requested transportation. An algorithm optimizes the routing, determining the shortest and fastest itinerary to collect the flowers, which are then sent together to the final destination.

Conclusions of the Projects

Conclusions of the Projects

In conclusion, the proposed projects aim to improve logistics in the olive and flower sectors, focusing on efficiency, sustainability, and innovation. By integrating advanced planning tools and fostering collaboration, these solutions can streamline operations, reduce costs, and create value for all stakeholders. With practical implementation, they address logistical challenges while benefiting producers, transporters, and the environment, offering a model for future industry development.

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Thank You!

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