

Is **Hop** Cultivation Profitable? Structural Profiles and Economic Viability in Italy

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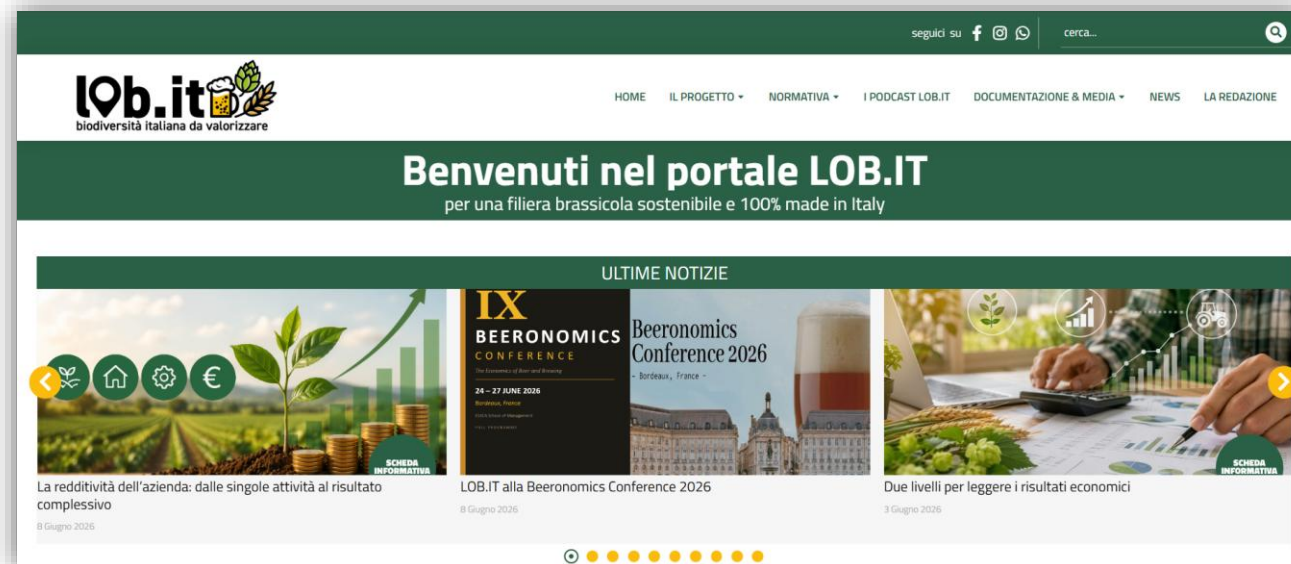
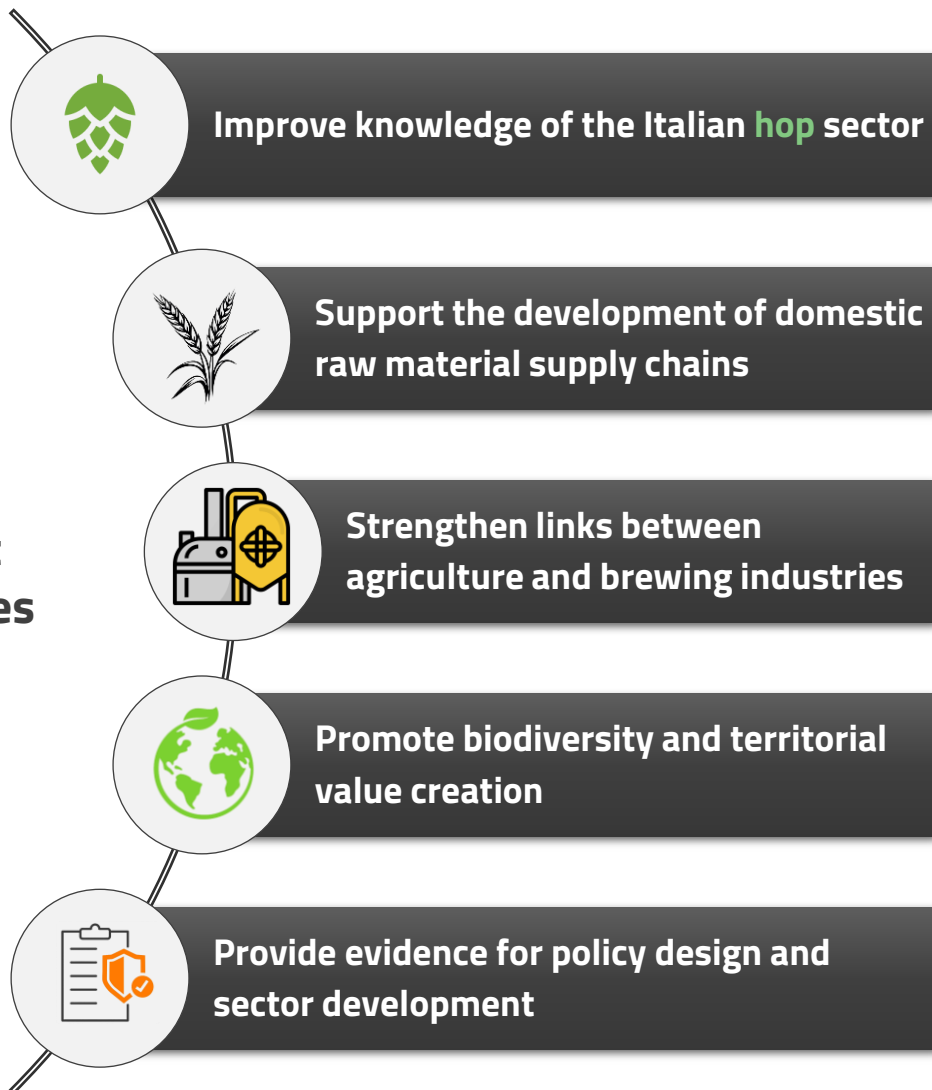
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The project: LOB.IT

Luppolo, Orzo, Birra: biodiversità Italiana da valorizzare



Main project objectives



Funded by the Italian Ministry of Agriculture, Food Sovereignty and Forestry (MASAF)

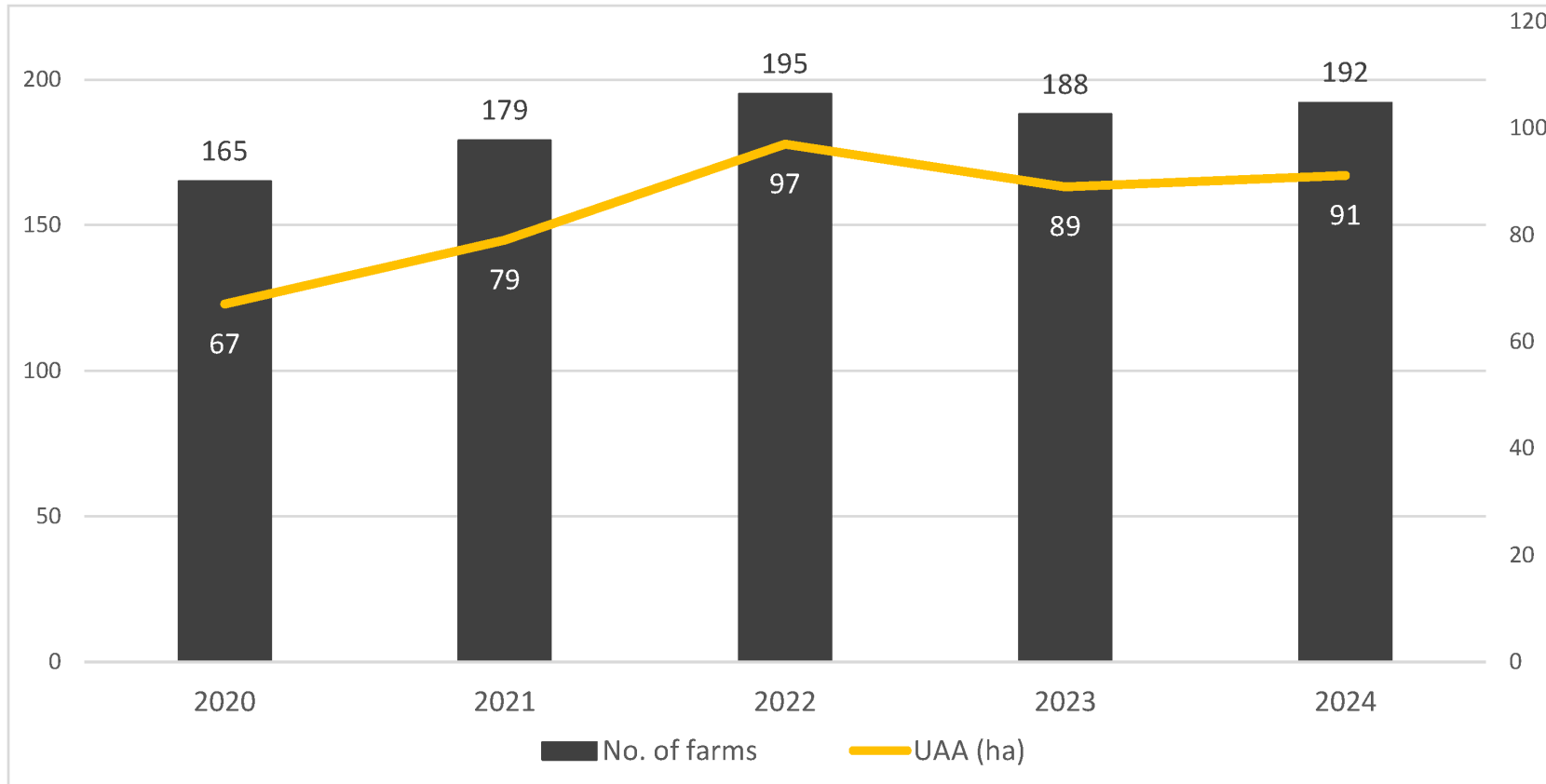
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www.lobit.crea.gov.it

Why Study **Hop** Cultivation in Italy?

The sector is growing rapidly, but its economic sustainability remains uncertain

Number of hop-growing farms and utilised agricultural area in Italy (2020–2024)



- Growing interest in local brewing ingredients
- Expansion of hop cultivation
- Increasing number of producers

Limited evidence on economic performance

The Italian **Hop** Paradox

A large beer market coexists with a very small domestic hop sector

2024

17.2 million hl of beer production

21.5 million hl of consumption

192 hop farms

91 hectares of hop cultivation



Research Questions

The study investigates whether distinct economic strategies exist among Italian hop farms

RQ1. Is hop cultivation economically viable?

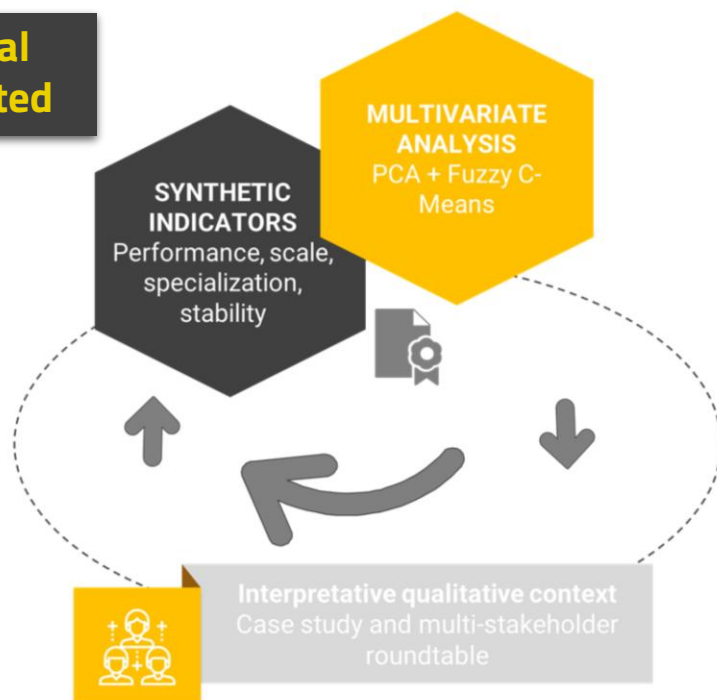
RQ2. Can distinct farm typologies be identified?

RQ3. Which factors explain economic success?

Research Design



Methodological approach adopted



Outlier detection (two-step procedure)

4 anomalous observations removed

1. Tukey's IQR rule ($1.5 \times \text{IQR}$)
2. Medcouple-adjusted boxplot + Modified Z-Score (MAD)

Final sample after outliers detection

- **13** hop farms observed during the period 2021–2023
- **32** farm-year observations in total

DATA

Two-stage multivariate approach

PCA + Fuzzy C-Means clustering

5 indicators

METHODS

Qualitative information collected through a **case study** and **stakeholder roundtable**

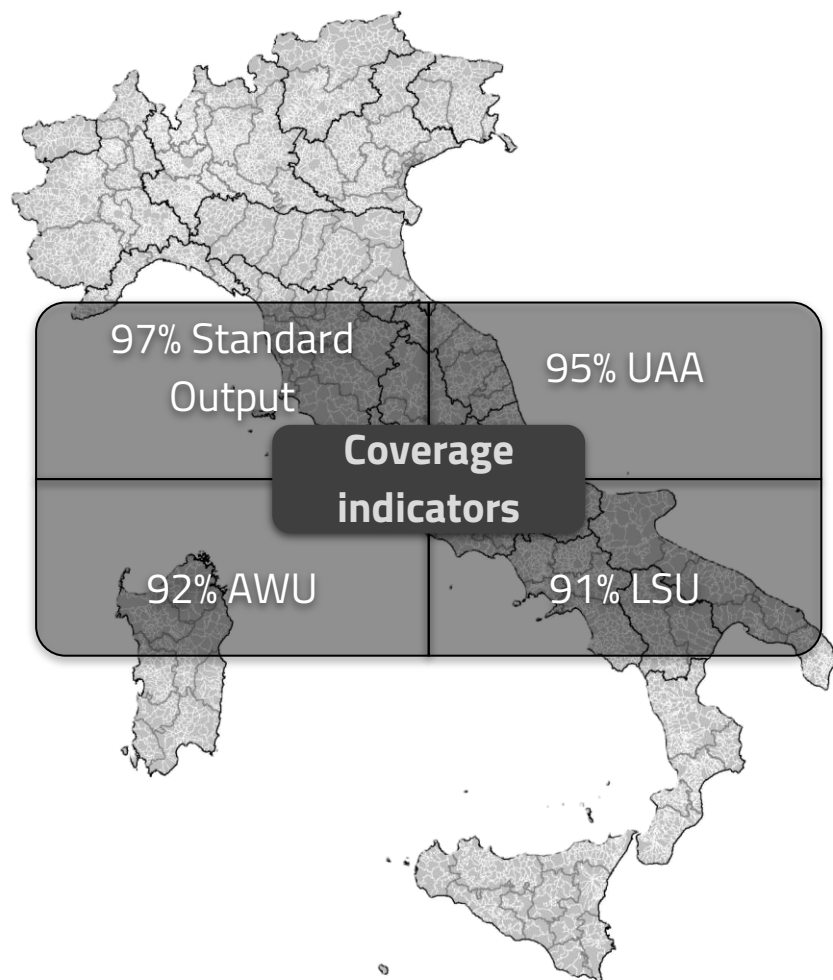
SUPPORT

The key economic indicators

Economic interpretation of the indicators used in the analysis

Variable	ID	Economic Dimension	Interpretation
Gross Margin [€/ha]	GM	Profitability	Measures the farm's ability to generate returns from hop cultivation after covering variable costs
Variable Costs [€/ha]	VC	Cost structure/Input intensity	Captures the level of input use and operational intensity associated with hop production
Hop Output [quintals/ha]	Q_HOP	Production scale/Productivity	Reflects productive capacity and distinguishes commercial from small-scale or experimental production
Specialisation Ratio	SH	Strategic orientation	Indicates the implementation level of hops within the farm's overall production strategy
Coefficient of Variation in GM	GM_cv	Income stability/Risk	Captures the variability and stability of economic performance over time

The Italian Farm Accountancy Data Network (FADN-RICA)



The Farm Accountancy Data Network (**FADN**) is an instrument for evaluating the income of agricultural holdings and the impacts of the Common Agricultural Policy

<https://rica.crea.gov.it/>

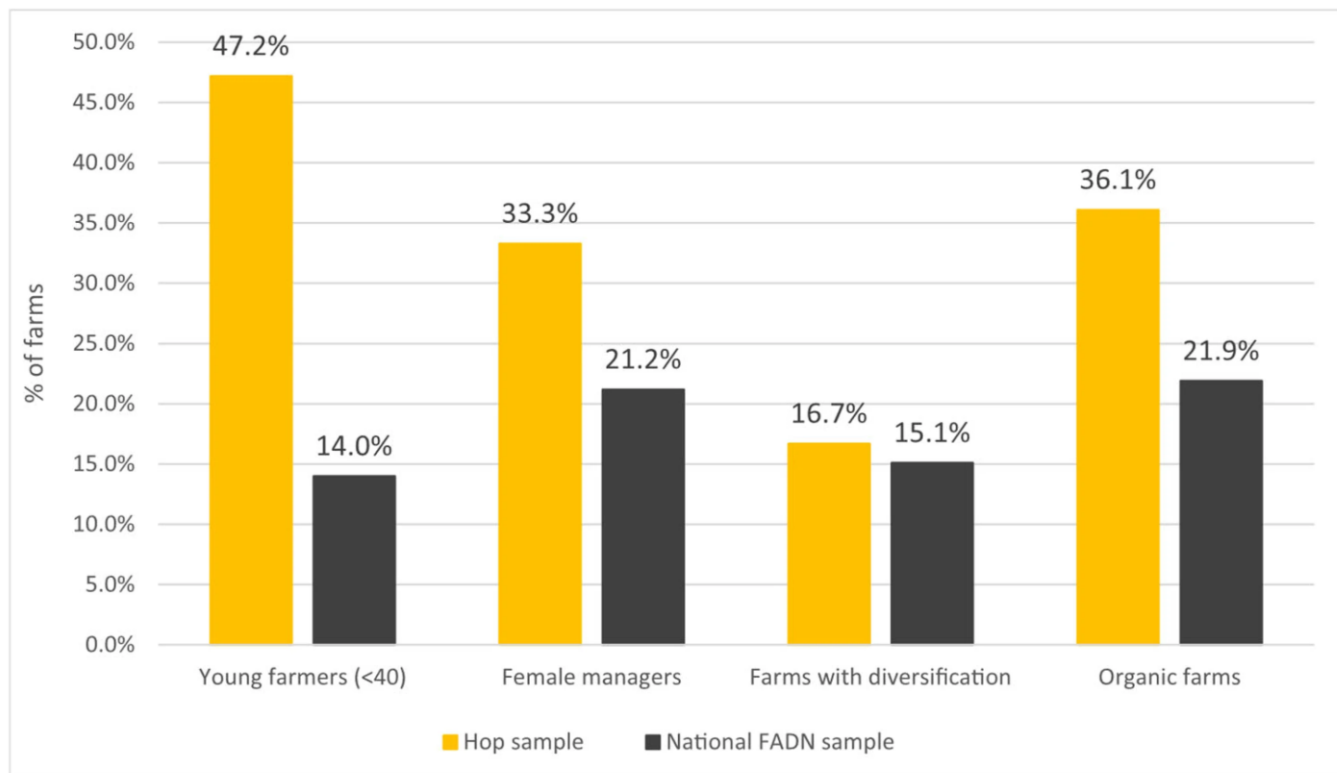
Stratified Sampling Design

- Geographical area
- Type of farming (OTE)
- Economic size class (Standard Output)
- Use of calibrated sampling weights

Reflection of Italian agricultural heterogeneity with approximately **11,000 farms** included

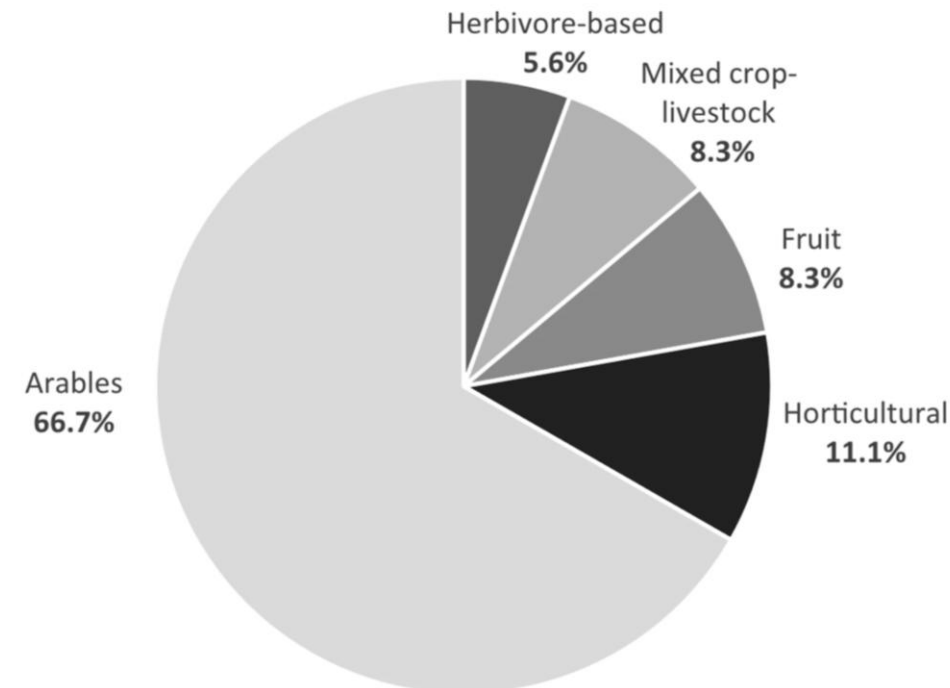
Who Are Italian **Hop** Farmers?

The sector is characterised by innovative and entrepreneurial farmers



Comparison between the hop farm sample and the national FADN sample across key demographic and structural variables

Distribution of the sampled farms by EU typology



Source: own elaboration based on **FADN** data (RICA data on three-year period 2021–2023)

Results 1 – PCA and Fuzzy Clustering

Italian hop farms follow different development trajectories

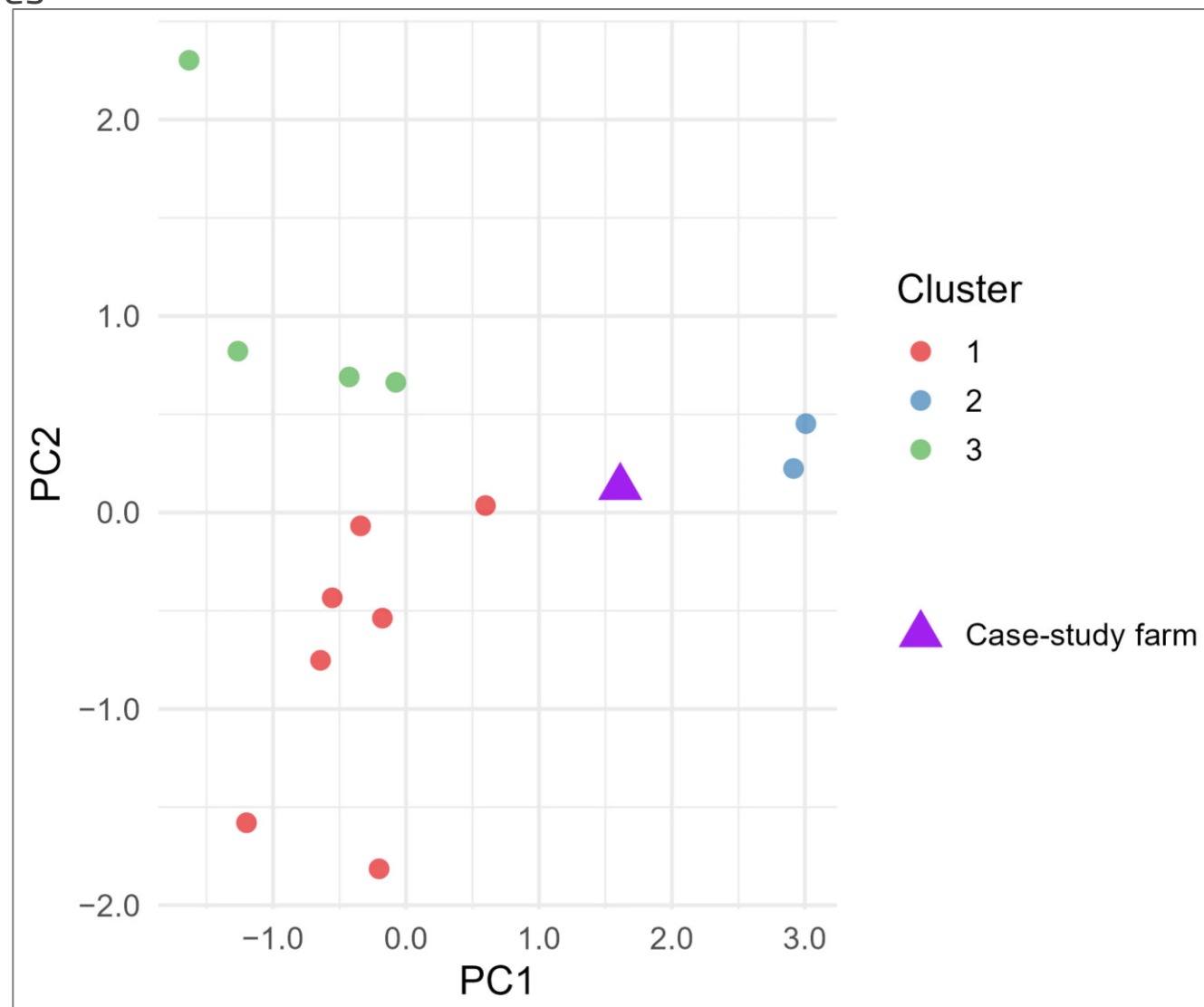
Three clusters were identified



High
variability

- productivity
- specialisation
- profitability

Hop cultivation cannot be analysed as a homogeneous activity



Results 2 - Comparison among clusters

Cluster 1

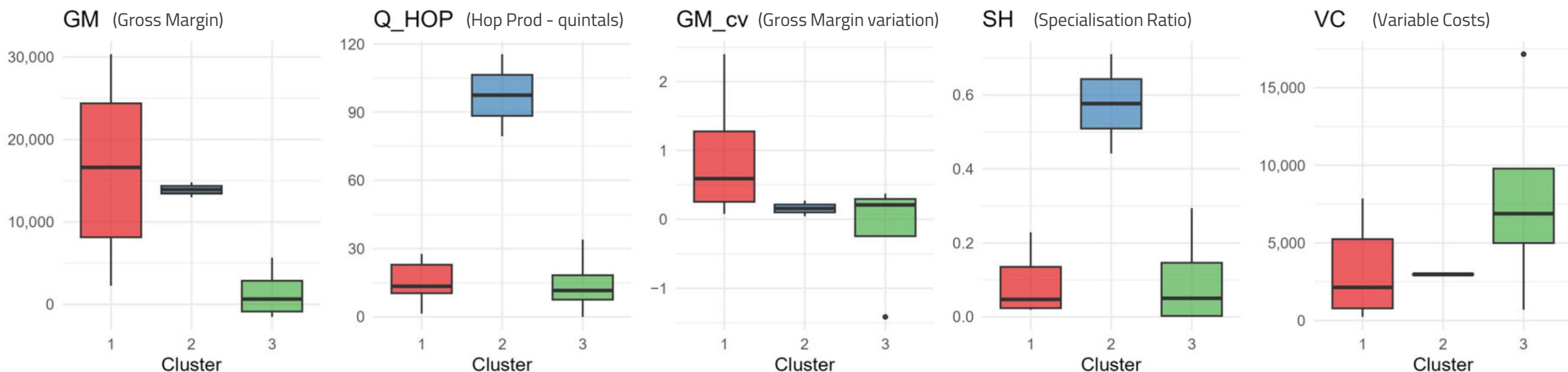
Diversified farms with balanced performance

Cluster 2

Highly specialised and efficient producers

Cluster 3

Fragile and underperforming entrants



Results 2 - Comparison among clusters

Coexistence of different business models rather than a single production strategy

Cluster 1

Diversified farms with balanced performance

Low specialisation ratio



Moderate yields



Stable economic performance



Hops represent a secondary activity



Cluster 2

Highly specialised and efficient producers

Highest specialisation ratio



Highest yields



Positive and stable margins



Greater technical expertise



Cluster 3

Fragile and underperforming entrants

Lower profitability



Lower yields



High income volatility



Limited structural capacity



Results 3 - Case Study as Interpretative Support

Understanding the drivers behind Cluster 2 performance

The **case study** was not included in the clustering analysis

It provides **qualitative insights** to support the interpretation of highly specialised farms (**Cluster 2**)

Case study
A Highly Specialised Hop Farm

Strong supply chain integration

Investment in post-harvest activities

Collaboration with intermediaries and breweries

Long-term strategic orientation

Cluster 2
Highly specialised and efficient producers

Highest specialisation ratio

Highest yields

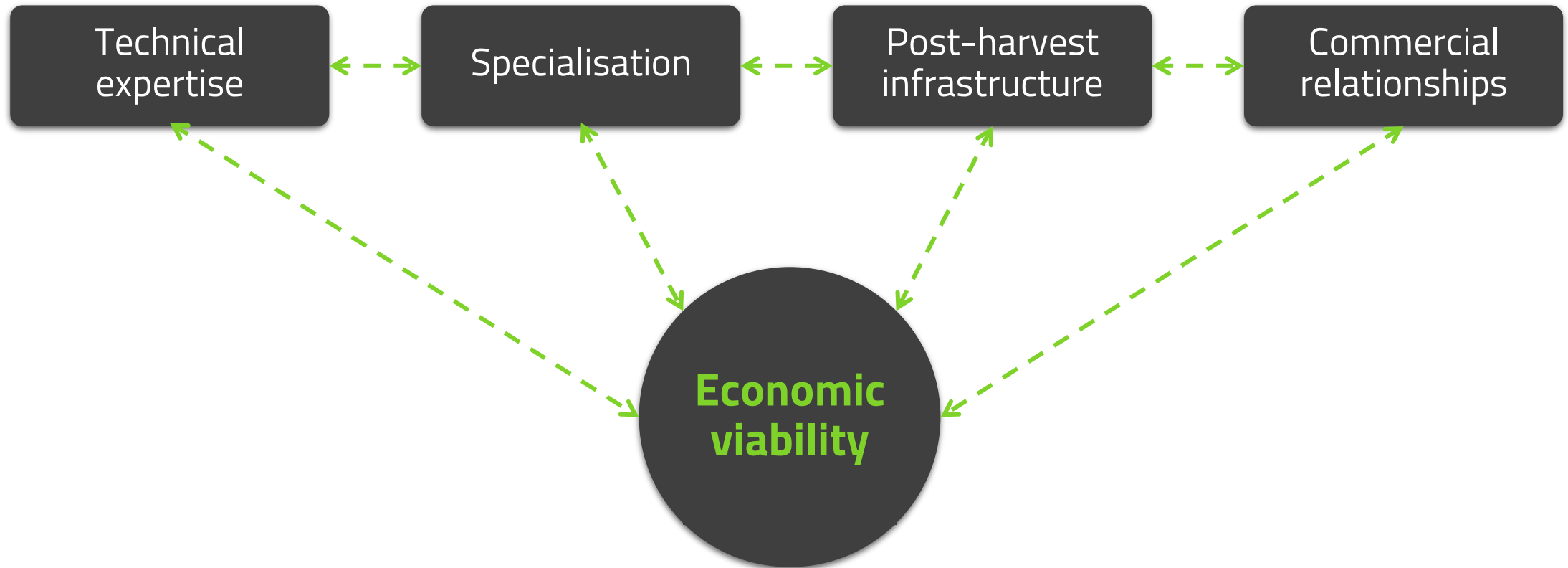
Positive and stable margins

Greater technical expertise



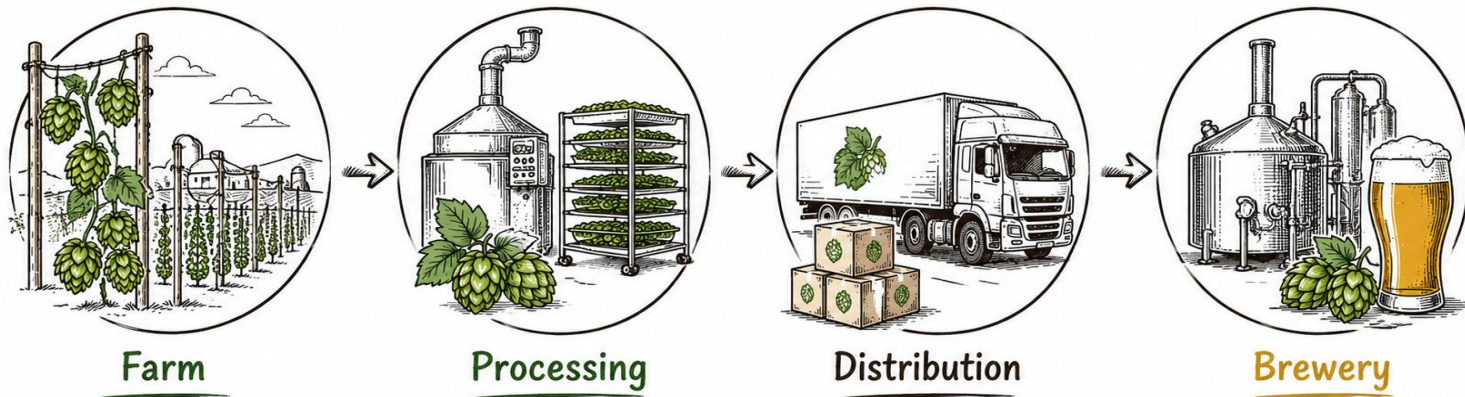
What are the real drivers of profitability?

Profitability cannot be explained by a single factor



Why Supply Chain Integration Matters

Farm performance is strongly influenced by activities occurring beyond primary production



The competitiveness of **hop** farms depends on the competitiveness of the entire supply chain

A
C
T
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V
I
T
A
L
S



Drying



Storage



Pelletisation



Quality control



Commercialisation

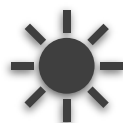
Structural Bottlenecks and Policy Implications

The development of the Italian hop sector is constrained by several technical and organisational bottlenecks

Main bottlenecks



Lack of registered plant protection products



Limited drying and pelletisation infrastructure



Fragmented production structure



Weak coordination among actors

Policy implications



Cluster 1 - Demand-side support



Cluster 2 - Certification and traceability



Cluster 3 - Technical assistance and collective infrastructure

Different business models require different policy solutions

Conclusions



Hop cultivation can generate positive economic results under Italian conditions



The sector is characterised by heterogeneous business models



Integrating factors within the supply chain is the key to success

Hop cultivation can be economically viable, but success depends on a specific combination of





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