



Study on the state of play of sustainability initiatives in the wine appellation sector

Report for the European Federation of
Origin Wines (EFOW)

06 June 2022

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ACRONYMS

AB	Agriculture Biologique
AOC	Appellation d'Origine Contrôlée
AOP	Appellation d'Origine Protégée
CAP	Common agriculture policy
CECRV	Conferencia Española de Consejos Reguladores Vitivinícolas
CNAOC	Confédération Nationale des producteurs de vins et eaux de vie de vin à Appellations d'Origine Contrôlées
CVRVV	Vinhos Verdes Region Viticulture Commission
DWV	Deutscher Weinbauverband e.V
EC	European Commission
EFOW	European Federation of Origin Wines
Federdoc	Confederazione Nazionale dei Consorzi Volontari per la Tutela delle Denominazioni dei Vini Italiani
FEV	Federación Española del Vino
GI	Geographical indication
GRI	Global Reporting Initiative
HVE	Haute Valeur Environnementale
INAO	Institut National de l'Origine et de la Qualité
IVDP	Instituto dos Vinhos do Douro e Porto
ODG	Organisme de défense et de gestion
OIV	International Organisation of Vine and Wine
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
SDGs	Sustainable Development Goals
SME	Système de Management Environnemental
VDC	Viticulture Durable en Champagne
WfCP	Wineries for Climate Protection

Introduction

The **EU's Green Deal** and its translation into food and agriculture policy through the **Farm to Fork Strategy** announced in 2020 have put sustainability firmly at the heart of the current and future policy-making in Europe. With the adoption of the Farm to Fork strategy, the European Commission (EC) has set a path for a fundamental change in European agriculture and food. The urgent need for strategies to adapt to climate change and mitigate its effects is also adding to the sense of upheaval increasingly felt in EU policy debates (EC 2019 and 2020).

It is in that overall context that the present study was commissioned to Arcadia International E.E.I.G. by the **European Federation of Origin Wines (EFOW)**, which members are **Conferencia Española de Consejos Reguladores Vitivinícolas (CECRV)**,¹ **Confédération Nationale des producteurs de vins et eaux de vie de vin à Appellations d'Origine Contrôlées (CNAOC)**,² **Confederazione Nazionale dei Consorzi Volontari per la Tutela delle Denominazioni dei Vini Italiani (Federdoc)**,³ and **Instituto dos Vinhos do Douro e Porto (IVDP)**,⁴ in partnership with the German winegrowers' association **Deutscher Weinbauverband e.V (DWV)**. The objective of the study is to provide a better understanding of the initiatives undertaken or available to the wine appellation sector to address sustainability. This report presents the results of the study based on the work carried out by the study team during the period **June 2021- January 2022**. It is structured as follows:

- Section 1 presents the objectives and the scope of the study taking into account the specifications drafted by EFOW and DWV;
- Section 2 describes the overall methodological approach applied to reach the objectives of the study and the workplan;
- Section 3 provides an overview of the state-of-the-art knowledge and practices in the field of sustainability in the wine sector;
- Section 4 presents the main findings of the study with regard to the sustainability practices currently implemented or available to producer groups of protected designation of origin (PDO) wines in the five main producing European countries on which the research primarily focused on;

¹ <https://vinosdo.wine/>

² <http://cnaoc.org/>

³ <https://www.federdoc.com/>

⁴ <https://www.ivdp.pt/>

- Section 5 considers and discusses the main challenges and impacts that the EU's sustainability agenda poses to the wine appellation sector;
- Section 6 considers and discusses the policy options available to the wine appellation sector to further contribute to the implementation of the EU's sustainability agenda; and,
- Section 7 finally presents the main conclusions of the study.

Section 1: Objectives and scope of the study

The present section presents the main objectives pursued by the study that was commissioned by EFOR in partnership with DWV and carried out by Arcadia International.

In accordance with the Specification drafted by EFOR and DWV ([Annex I](#)), the first objective of the study is to provide a detailed mapping of the sustainability initiatives that have been undertaken to date, or are available to, PDO wine producer groups in the various countries studied, with a view to gathering evidence as to where the European wine appellation sector currently stands in terms of sustainability priorities and concrete actions (**Objective 1**). The study also aims at providing insights and recommendations to the European wine appellation sector on potential future approaches to sustainability, taking into account the urgency to respond to the challenges posed by climate change, among others, and the ambitious targets set by the EU's sustainability agenda for agriculture and food production (**Objective 2**).

In this context, sustainability has been interpreted in its broadest sense as a concept encompassing different intertwined dimensions, including environmental, economic, social/health aspects.

In line with the Specification of the study, the scope of the research covers the five main wine-producing countries in Europe, i.e. **France, Germany, Italy, Spain and Portugal**. In addition, during the initial stages of the study, the following aspects relevant to its scope were discussed and further clarified in cooperation with EFOR and DWV:

- The use for the purpose of the different study activities of an **operational definition of 'sustainability initiative'**, i.e. *'any initiative that can help PDO wine producers to be more sustainable or help them demonstrate how sustainable they are'*;
- The exclusion from the scope of the research of activities carried by producer groups of protected geographical indications (**PGI wines**); and,
- The **period of time examined by the study**, which covers any sustainable initiative undertaken, or available, to PDO wine groups in the five European countries targeted **as of 2016 until now**.

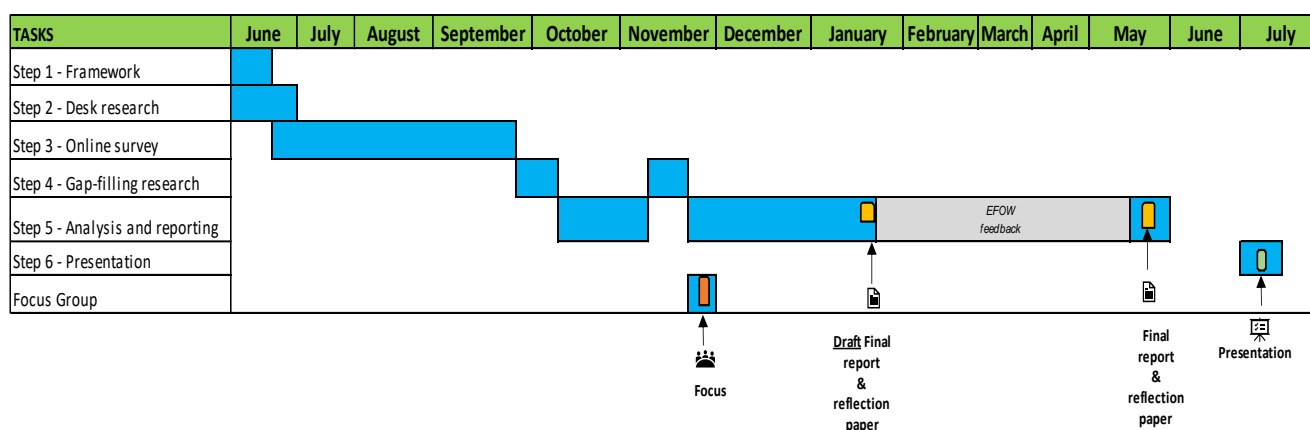
Section 2: Methodological approach

The methodological framework developed and applied during this study follows a step-by-step approach and consists of a mix of data collection tools, including:

- i) Desk research at country level;
- ii) An online survey targeting PDO wine groups in the five European countries studied; and,
- iii) An online focus group gathering national sustainability experts designated by EFOW members and DWV.

Figure 1 provides an overview of the methodological approach applied during the overall duration of the study.

Figure 1. Methodological approach: overview and respective workplan



Desk research

In line with the methodological framework that was developed for the study, the study team first performed extensive desk research at country level to identify any relevant information on sustainability initiatives undertaken by, or available to, PDO wine groups in the targeted countries. Desk research led to the identification of an initial list of sustainability initiatives to be included in the mapping to be performed in accordance with the Specification of the study. In so doing, it also provided a preliminary characterisation of the PDO wine sector from a sustainability standpoint in each of the targeted countries.

The above referred list was subsequently triangulated with the list of initiatives that were identified by PDO wine groups through the online survey (see below). Besides, further desk research was carried out by the study team to fill in any information gap, as appropriate.

The findings of the desk research performed for the purpose of the study were eventually consolidated in a single file where detailed information on international and national sustainability initiatives relevant to the European wine appellation sector is provided (Annex 2 to the present report). The framework for the desk research carried out during the study was inspired and adapted from the evaluation framework developed by Corbo *et al.* (2014) for the analysis of the existing sustainability programmes in Italy.

In addition, data and information gathered via desk research was used to draft a **list of concrete sustainability measures**, which, as recognised best practices, could be implemented by PDO wine groups (Annex 3 to this report).

Online survey

The online survey, which was launched on 7 July 2021 and closed on 24 September 2021, had the primary objective to contribute towards a better understanding of the sustainability initiatives currently implemented or under development across the European wine appellation sector. The survey was launched in English, French, German, Italian, Spanish and Portuguese. Some of the questions contained in the survey, notably those under Section B addressing the drivers and barriers to implementing sustainability initiatives within the European wine appellation sector, were inspired and adapted from the research work carried out by De Steur *et al.* 2020.

Overall, the survey generated a total of **113 valid responses**, which were retained and considered for the analysis. The vast majority of the respondents (n=98, i.e. 88%) identified themselves as a PDO wine producer group. On the other hand, 15 respondents indicated that their organisation was an entity other than a PDO wine producer group, having one of the following legal forms: professional/trade/industry association, federation, confederation, interprofessional organisation or regulatory council.

Following the closing of the survey, the study team, in cooperation with EFOW and DWV, clarified that some respondents had answered on behalf of several other PDO wine groups located in the same region or geographical area. Taking this element into account, in total, the number of responses and representativeness obtained per country amounted to:

- France: 27 respondents – 239 PDO wine producer groups represented (75%*);
- Germany: 7 respondents – 13 PDO wine producer groups represented (54%*);
- Italy: 46 respondents – 145 PDO wine producer groups represented (66%*);
- Portugal: 3 respondents – 2 PDO wine producer groups represented (100%*); and,

- Spain: 30 respondents – 32 PDO wine producer groups represented (63%*).

* **Response rate in relation to the total number of EFOW and DWV members.**

In light of such clarifications, overall, the survey's response rate can be regarded as **satisfactory** in addition to being **fully representative** of the European wine appellation sector that EFOW and DWV represent, ranging from a minimum of 54% in Germany up to a maximum of 75% in France and 100% in Portugal, respectively.

Altogether, the survey identified **158 sustainability initiatives** undertaken by the members of PDO wine groups or in which they take part. Overall, Italy was the country with the highest number of initiatives mapped out (51), followed by France (50), Spain (41), Germany (10) and finally Portugal (6).

The full list of survey questions as well as the detailed analysis of the survey results can be found in [Annex 4](#) to this report.

Online focus group

The focus group took place on 23 November 2021 and gathered wine sustainability experts for each of the countries studied. The objective of the focus group was twofold. On the one hand, the exchange of views within that setting contributed towards a better understanding of some of the findings emerging from the online survey (for instance, the fragmentation in the way PDO wine producer groups approach sustainability, the emphasis given to the environmental dimension as opposed to the other sustainability dimensions etc.). On the other hand, the discussion held within the focus group served also to explore possible pathways to ensure greater convergence in the approach of the European wine appellation sector to sustainability. [Annex 5](#) to this report contains a detailed account of the discussion held in the focus group.

Section 3: Sustainability in the wine sector: an overview

For some years now **sustainability** has turned into an **area of concern, investment and interest** to the wine sector across the globe.

Indeed, on the one hand, the wine sector is currently exposed to challenges created by **climate change, biodiversity loss, resource scarcity** (in particular water), economic viability and societal calls to protect **consumers' health** and reduce **energy consumption**. Those challenges are not specific to the wine sector. On the other hand, each stage of which the wine supply chain consists of – i.e. viticulture, wine-making, bottling, logistics and distribution - has specific **environmental, economic and social impacts** (Castellini et al. 2017; Gilardoni 2020; Morales-Castilla et al. 2020; Santini et al. 2013; Sabbado Flores 2018).

In parallel, the growing **consumer demand for sustainable products** that has been registered over the last decades constitutes a major external driver for the stakeholders of the wine supply chain to engage, implement and showcase sustainable practices, insofar as sustainability is perceived as a **differentiating factor** by several of them. In this context, adherence to **sustainability certification programmes** guarantees winegrowers and wine-makers greater credibility and trust before commercial partners and consumers, although the scope and robustness of such programmes may vary significantly from one case to another.⁵

In turn, the competitive advantage associated with the adoption of sustainable practices is at the root of the practice commonly known as **'greenwashing'** - i.e. marketing claims on the environmental performance and/or characteristics of a given product or service that are untrue, unsubstantiated and/or exaggerated – which is reported to occur also in the wine sector (De Steur et al. 2020; Gilardoni 2020; Pomarici & Vecchio 2019).

At international level, the increased awareness about sustainability in the wine sector has led, among others, to the adoption of a set of general principles - notably for the **sustainability of vitiviniculture** - by the **International Organisation of Vine and Wine (OIV)**. As opposed to prior guidelines elaborated by the same organisation that mostly focused on the environmental dimension of sustainability, such principles were primarily drafted with the aim to ensure that the economic and social dimensions of that concept were given proper and equal consideration (OIV 2016; Pomarici & Vecchio 2019).

Notwithstanding the above, the term 'sustainability' remains today a concept that lacks a precise and univocal regulatory definition, at international and European level as well as in most national contexts, for most consumer products, including wine. Existing definitions often **lack specificity** and/or are **not comprehensive enough**, addressing only specific issues and/or stages of the supply chain.⁶ As such, the word 'sustainability' is susceptible of **different interpretations** and, as a result, **practical applications**. It is therefore also prone to be misused by businesses, potentially resulting in business partners and final consumers being misled about the true characteristics of a product or a service marketed as 'sustainable', 'environmentally friendly' or under equivalent claims (Baiano 2021; Szolnoki 2013). In the

⁵ Early in 2020, at the request of the Nordic Alcohol Monopolies and the Swiss retailer Denner, Intertek published a benchmark study on selected sustainability wine certification schemes at global level, taking into account the following aspects: Governance & Quality, Environmental Cultivation, Environmental Production and Human Rights & Labour Practices. As a result of this benchmarking exercise, some of the sustainability certification programmes mapped by the present study were ranked amongst the most comprehensive and robust ones (e.g. Equalitas Sustainable Wine, Fair 'n Green, V.I.V.A, Wines of Alentejo Sustainability Programme etc.).

⁶ This is the case of the very first definition of 'sustainable development' contained in the Brundtland report 'Our Common Future' published in 1980 by the United Nations World Commission on Environment and Development («*Sustainable development is development that meets the needs of current generations without compromising the ability of future generations to meet their own needs*») as well as of 'sustainable vitiviniculture' as defined in the OIV context («*Global strategy on the scale of the grape production and processing systems, incorporating at the same time the economic sustainability of structures and territories, producing quality products, considering requirements of precision in sustainable viticulture, risks to the environment, product safety and consumer health and valuing heritage, historical, cultural, ecological and landscapes aspects*», Resolution OIV CST 1/2004).

case of wine, for instance, ‘sustainability’ is a concept that has been often reported to be specifically associated by consumers with organic or biodynamic wines, although those market segments do not exhaust the full range of attributes that can contribute to making a wine sustainable (Santini et al. 2013; Szolnoki 2013).

As far as the wine sector is concerned, the **lack of a shared understanding** of what ‘sustainability’ concretely means has contributed, over time, to the development and implementation of different approaches, methods, practices and solutions across and within wine-producing regions (Baiano 2021). This is particularly apparent if one considers, for instance, that several of the existing sustainability initiatives in the wine sector focus only on one or few stages of the wine supply chain, thus without the holistic approach that sustainability would require (Bandinelli et al. 2020). Also, most sustainability initiatives that have been studied to date in the wine sector seem to place greater emphasis on the environmental impact of the activities related to wine production rather than on their economic and/or social implications. By way of an example, even in relation to the most advanced wine sustainability programmes that are currently in place, it has been observed that, while clear indicators have been set for measuring the environmental impact of wine production, comparable indicators have not been developed for other impacts (Sabbado Flores 2018).

In conclusion, despite the great relevance that sustainability has acquired for the wine sector over the last decades, there is currently **no common approach or vision** at level of that sector on how to frame and address it (Baiano 2021).

The absence of a shared understanding and approach to sustainability in the wine sector, however, does not imply that **good practices** addressing sustainability cannot be identified in the modern wine supply chain. This is particularly true for **environmental practices**, which, in general terms, consider the impact of viticulture and/or other wine-making related activities on the quality of air, water, soil and landscape, among others, and which, by all accounts, are those that have been studied most in scientific literature (Bandinelli et al. 2020).

For example, in relation to **viticulture**, the use of **precision agriculture** and **intelligent agriculture machines**, including for the improvement of crop quality and for an increasingly targeted application of plant protection products and fertilisers, **micro-irrigation**⁷ and **bio-bed systems**⁸ are generally considered appropriate environmental management solutions and, as such, sustainable practices.

⁷ Micro-irrigation presents major advantages when applied in viticulture from a sustainability standpoint if compared to other traditional irrigation techniques (e.g. irrigation by sliding, rain irrigation). On the one hand, as micro-irrigation aims at watering only a specific surface of the soil, it prevents excessive evaporation and soil erosion in the long run. On the other hand, it also does not wet vine leaves, thus eliminating the natural conditions for the development of potentially noxious parasites (see in this respect, Bandinelli et al. 2020; Raimondi 2014).

⁸ Bio-bed systems are areas where residues generated by viticultural practices are conveyed through water streams. They are composed of organic materials, such as soil, straw and peat, that are able to decompose residues avoiding their dispersion in the environment (Bandinelli et al. 2020).

Conversely, in relation to **wine-making**, the **avoidance of chemical substances** during the vinification process is among the most common practices that are generally regarded as sustainable.⁹ Other measures are aimed at reducing the environmental impact deriving from the **construction and/or the daily management of wine cellars**. The latter entail a fundamental rethink of cellars' overall design to ensure their optimal integration in the surrounding landscape (e.g. construction of new underground structures), their self-sufficiency in terms of energy supply (e.g. placing of solar panels on existing structures) and/or the minimisation of their waste and emissions (e.g. construction in close proximity to vineyards), while preserving their key functionalities for oenological purposes.

Finally, considering the final stages of the wine supply chain, i.e. **bottling and distribution**, the most common sustainable practices are generally aimed at reducing the adverse impact of business activities on air quality and involve solutions such as the **production of bottles, packaging and product labels from recycled or alternative raw materials**. However, if those solutions have been proven to be more effective from an environmental protection standpoint, they may present some limits in preserving wine quality (e.g. by preventing oxidation) or in terms of consumer acceptance (Baldinelli et al. 2020).

As highlighted also by the relevant literature on the topic (Schäufele & Hamm 2017), a similar overview cannot be provided for the economic and social dimensions of the sustainability of the wine supply chain, which is an area that needs to be further researched and analysed in the future.

Section 4: State of play of sustainability initiatives in the wine appellation sector

The present section discusses the main findings of the study with regard to the state of play of sustainability initiatives within the European wine appellation sector. The analysis conducted hereinafter is based on the data and information collected by the study team primarily through the online survey and desk research. Besides, as explained under Section 2 of this report, the online focus group provided additional information and insights to better understand and characterise the current state of the art of the sector under exam in terms of sustainability practices.

Against this background, while Section 4.1. provides the overall state of play of sustainability initiatives across the five countries studied, Section 4.2. contains a more detailed analysis of each national context.

⁹ The use of chemical substances in wine-making can be reduced by using, for instance, sulphur dioxide, an additive with preservative and antioxidant properties, though within the limits allowed by law, owing to its proven toxicity. Alternatively, grapes can be subject to ozone treatments, which are equally useful for vinification purposes and cause less concern from a public health perspective (Baldinelli et al. 2020; Bellincontro A. 2017).

4.1. Overall state of play

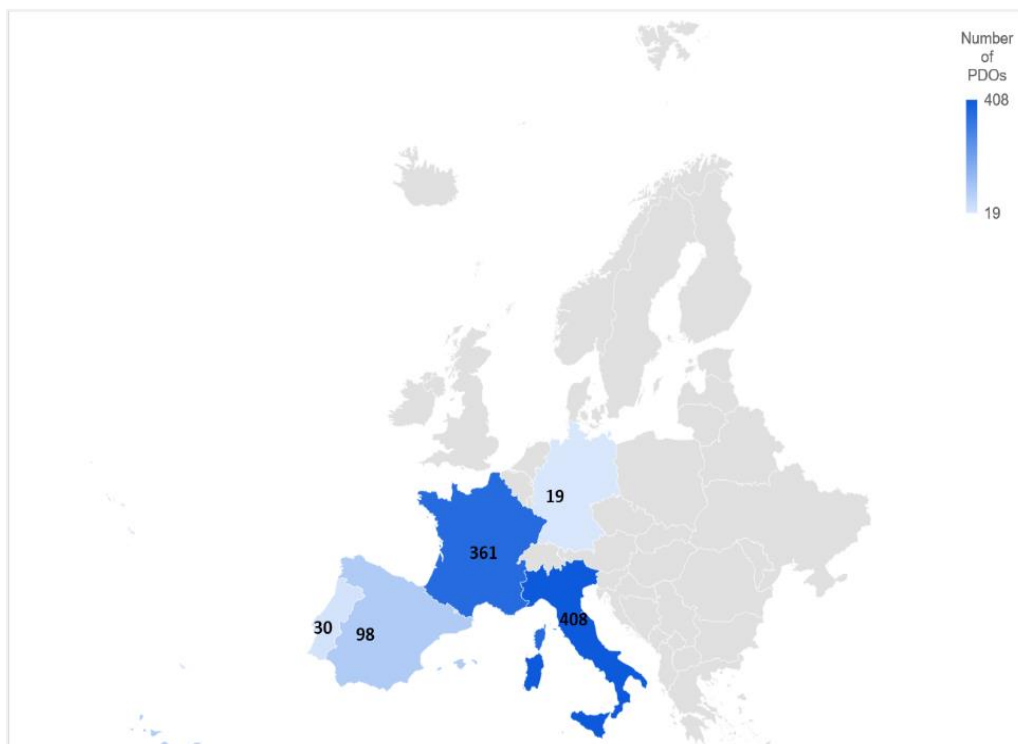
An overall state of play of sustainability initiatives in the European wine appellation sector can be drawn by considering the following elements:

- A characterisation of the European wine appellation sector;
- The understanding that PDO wine producer groups have of sustainability, or, in other words, of what makes a wine ‘sustainable’;
- The most important drivers that push PDO wine producer groups to undertake or join sustainability initiatives and the barriers that prevent them from acting;
- The number, period of adoption, type and scope of the different initiatives that such groups have undertaken or adhered to so far in order to become more sustainable; and,
- The likelihood that the current scenario may change in the near future, taking into account to what extent PDO wine producer groups envisage to allocate additional resources to improve their performance from a sustainability standpoint and on which specific sustainability aspects / issues.

4.1.1. Characterisation of the European wine appellation sector

According to the EU’s GI register (eAmbrosia), there are currently 1,623 GIs in the wine sector. With regard specifically to PDOs, the EU has 1,178 entities of that type registered, with the countries under study – France, Germany, Italy, Portugal and Spain – representing 77.8% of the total (Figure 2).

Figure 2. Number of PDOs by country under analysis (n=916)



Source: eAmbrosia available at <https://ec.europa.eu/info/food-farming-fisheries/food-safety-and-quality/certification/quality-labels/geographical-indications-register/> (Data extracted on 23 February 2022)

In terms of value, sales of GI wines in the EU (including the UK) amounted to 39.4 billion EUR in 2017 - with wine representing more than half of the total sales value of GI agri-food products - and have increased by 33% since 2010. In 2017, PDO wines accounted for the largest share both in terms of volume (71%) and value (84%). The countries under study accounted for 90% (in volume) and 95% (in value) of the total sales of GI wines in the same year. Over the 2010-2017 period, extra-EU trade increased significantly (+70% in value, which equals to 3.5 billion EUR). Overall, **GIs represented 15.5% of the total EU agri-food exports** in 2020. Also, in 2017, in the EU (including the UK) 56% of the volume of wine produced was sold under PDOs and PGIs (EC 2020b, EC 2019b).

A study published by the EC in 2021 found that GIs offer a wide range of possible benefits for farmers / producers as well as local communities. GIs have a **positive impact on employment in rural areas**, while GI farmers / producers' benefit, in general, from **higher incomes** compared to non-GI farmers / producers at EU level. The indirect impact of quality schemes is multifold such as land price, development of tourism attractivity and diversification of farm holdings. In particular in the wine sector with oenotourism and the relationship between the image of famous wines and their territory. The

same study also pointed out that there is some room for further integration of the environmental dimension of sustainability in GIs (EC 2020c).

Given their economic relevance for the EU agri-food chain, GIs farmers / producers alongside their groups and associations are well positioned to play a **key role in the ongoing transition to more sustainable food production systems** and act as **leverage for change**. They are therefore strategic partners that need to be included in the design and implementation of current and future policy actions in this area, both at EU and national level. In line with this approach, the CAP reform post-2022 has established specific rules regarding GIs and sustainability. Among others, the reform of the CAP has given the possibility to introduce **sustainable development criteria in the product specification on a voluntary basis** (EC 2021). This is a measure that the GI sector called for during the CAP negotiations, although it did not find wide support across all public authorities.

Within the GI wine sector, PDO groups have an important added value as **agricultural collective structures**.

On the one hand, PDOs play a key role in the definition of the elements of which product specifications consist, which are binding on all producers. On the other hand, they operate as platforms that facilitate the exchange of information and the dialogue between their members promoting joint actions and the uptake of best practices.

Furthermore, from a sustainability standpoint, PDO wine groups will be necessarily at the forefront of the ongoing ecological transition. Because of the inherent link they have with a given terroir, PDOs will not be able to relocate elsewhere, being compelled to adapt their production systems to eliminate or minimise any negative impact on the environment.

With regard to the different sustainability dimensions, the findings of this study indicate that the **three-pillar approach by PDOs is reductive as there are several hybrid dimensions** to be considered, for instance, with regard to biodiversity and landscape, heritage and culture, pesticides control etc. Also, as it will be shown in the following section (4.1.2.), currently PDO wine groups seem to place more emphasis on the **environmental dimension** of sustainability than on other sustainability aspects. This may be due to the fact that environmental issues are considered at present as the **best action level** for winegrowers, while other issues are at other stages of development / uptake or subject to specific constraints. Even so, PDOs' efforts on economic and social aspects are long-standing, notably to create added value for producers and the territories on which they operate by making PDO wines competitive through the adaptation of the production to the demand, the improvement of quality and the promotion of the terroirs.

4.1.2. Understanding of sustainability within the European wine appellation sector

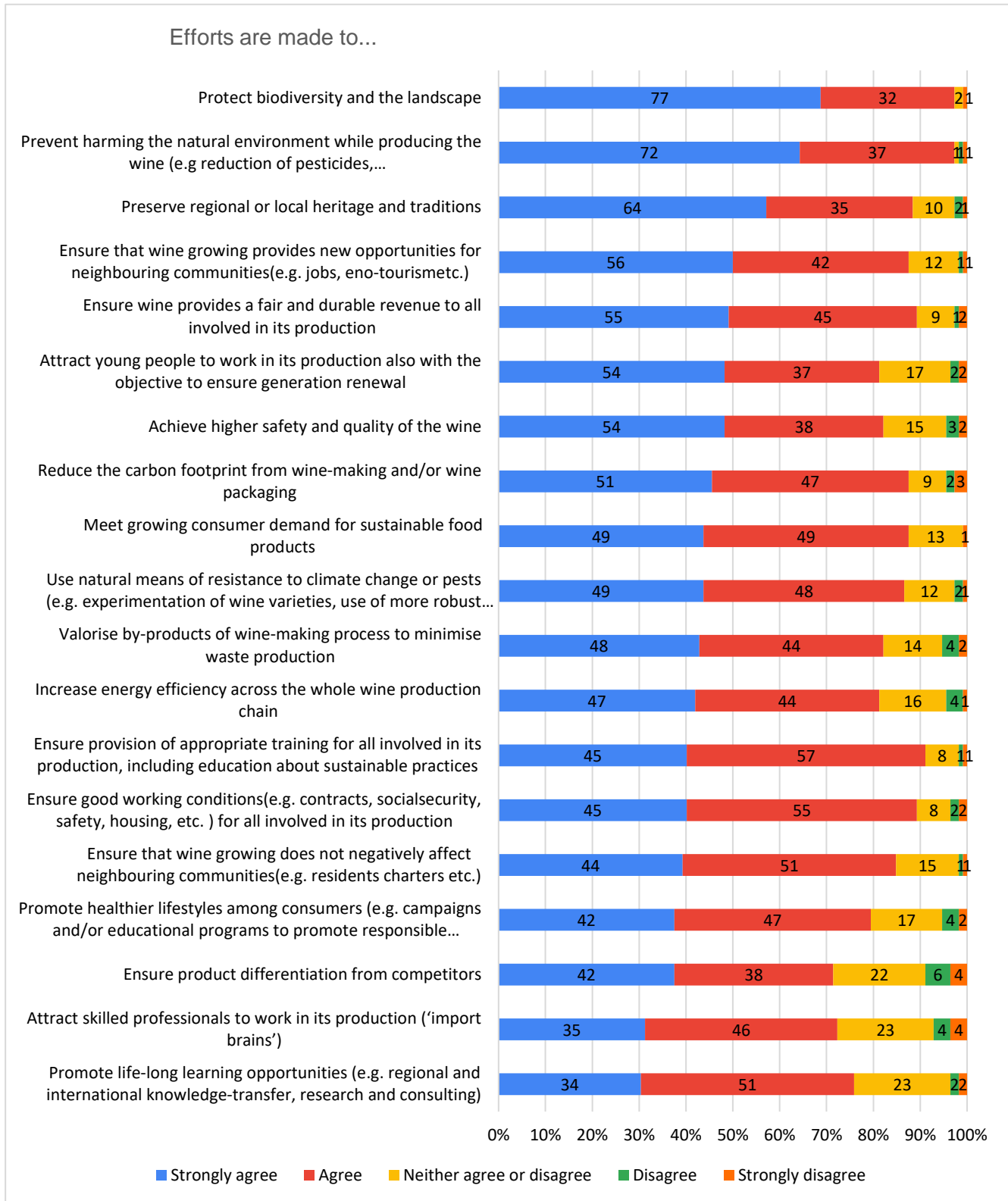
Based on the data obtained through the online survey, as shown in Figure 3, the majority of PDO wine producer groups strongly agree that the definition of '**sustainable wine**' involves primarily efforts that are associated with the **protection of the surrounding environment** and **local heritage** and namely:

- '*Protect biodiversity and the landscape*' (68% of the respondents);
- '*Prevent harming the natural environment while producing the wine (e.g. reduction of pesticides, fertilisers, water, no in-row weeding etc.)*' (65%); and,
- '*Preserve regional or local heritage and traditions*' (57%).

Among the different definitions presented, PDO groups are more likely to disagree with the definition according to which 'sustainable wine' means that efforts are made to '*ensure product differentiation from competitors*' (10% of the sample surveyed indicated that they 'disagree' or 'strongly disagree' with such a definition). Nonetheless, more than one third (37%) strongly agree with this definition of 'sustainable wine'.

Also, a relatively significant number of PDO groups surveyed do not agree with 'sustainable wine' meaning that efforts are made to '*attract skilled professionals to work in its production (import brains)*' (7% 'disagree' or 'strongly disagree' with that statement). Even if it is one of the definitions on which most PDO groups disagree, still 72% of the sample surveyed indicated that they agreed or strongly agreed with that definition.

Figure 3. How much do you agree with the following definitions of what 'sustainable wine' means? (n= 113) (Aggregated data)



In spite of the apparent different weight attached to the various definitions of ‘sustainable wine’, several PDO groups stated that all three pillars of sustainability, i.e. environmental, social and economic, are inherently interconnected and thus equally relevant for the sustainability of the wine supply chain. The discussion held in the online focus group with national sustainability experts confirmed somehow this finding, with the repartition of sustainability into pillars being perceived at the same time as artificial and reductive of a concept that consists of several hybrid dimensions such as biodiversity and landscape, culture and heritage, competitiveness, job creations, labour rights, pesticide use etc.

4.1.3. Drivers and barriers to the uptake of sustainable initiatives in the European wine appellation sector

In general, according to the PDO groups that took part in the online survey, the **most important levers** that push a PDO wine producer to develop or adhere to a sustainability initiative are that:

- ‘Consumers are asking for it’ (93% respondents selected this driver as one of the five most important ones);
- ‘They want to protect biodiversity and the landscape’ (88% respondents selected this driver as one of the five most important ones);
- ‘They want to limit the impact of wine production on the environment’ (83% respondents selected this driver as one of the five most important ones); and,
- ‘They feel it is the right thing to do’ (82% respondents selected this driver as one of the five most important ones and 34% respondents selected this option as the most important driver).

In contrast, the driver that is considered as, overall, less impactful is that ‘*the neighbouring communities are asking for it*’ (only 52% respondents selected this option as one of the five most important drivers and only 8% selected this option as the most important driver).

Considering the **most important barriers** that prevent PDO wine groups from undertaking sustainable initiatives from the survey, it emerges that the following rank at the top:

- ‘Concern about the extra costs and investments needed’ (88% respondents selected this barrier as one of the five most important barriers); and,
- ‘Excessive bureaucracy associated with it’ (81% respondents selected this barrier as one of the five most important barriers).

This result is largely in line with the findings from previous research on this subject (for instance, De Steur et al. 2020), which singles out **costs** (labour, investments etc.) and **bureaucracy** besides greenwashing as key deterrents to adopting sustainability initiatives, especially among small and

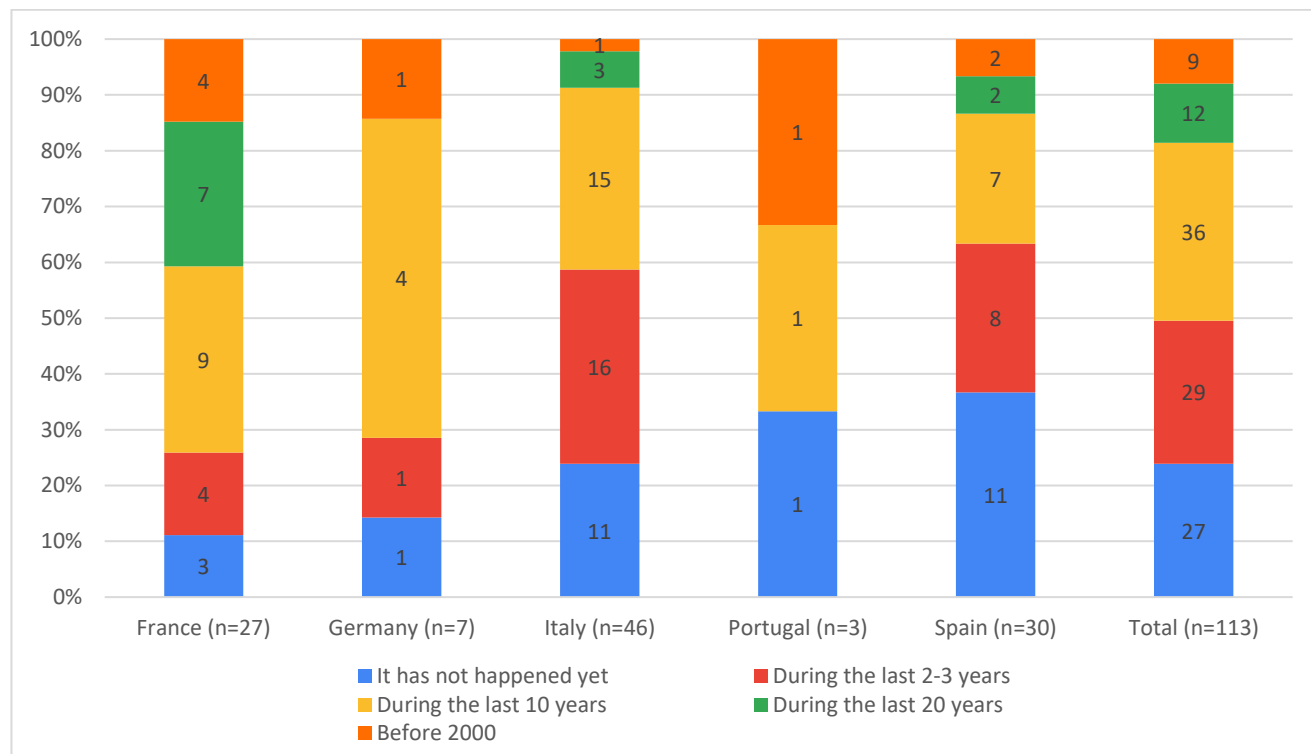
medium wine businesses. In this respect, it is interesting to note that none of the PDO wine groups that took part in the survey require their members to be certified against the international environmental standard **ISO 14001**, which, according to the literature reviewed by the study team, is considered too expensive for the average wine company (De Steur et al. 2020; Szolnoki 2013).

4.1.4. Characterisation of the existing sustainable initiatives in the European wine appellation sector

Total number and current status – As already anticipated, the online survey allowed to identify **158 sustainability initiatives** that have been undertaken by PDO wine groups or in which they take part across the five European countries studied. Overall, Italy is the country with the highest number of initiatives mapped out through the survey (51), followed by France (50), Spain (41), Germany (10) and, finally, Portugal (6). 61% of the initiatives identified were already **fully operational** at the time of the survey, whereas 21% were still being piloted and 14% had been defined but not yet tested. In terms of number of sustainability initiatives per single respondent / PDO group, the majority (47%) indicated that **only one initiative** had been undertaken or joined at the time of the survey.

Time of adoption – A closer look at the survey data (Figure 4) shows that the vast majority of the PDO wine groups developed or adhered to a sustainability initiative either **during the last decade** or **over the last 2-3 years** (32% and 26% of the respondents, respectively). Only 8% of the organisations surveyed stated they had developed or adhered to a sustainability initiative before 2000. Conversely, in 24% of the cases no sustainability initiative had been developed or joined at the time of the survey. Overall, France is the country with the greatest number of PDO wine groups having developed or adhered to a sustainability initiative for the longest time: 41% of the organisations surveyed in that country have developed or adhered to an initiative with a sustainability focus in the last 20 years or even before 2000.

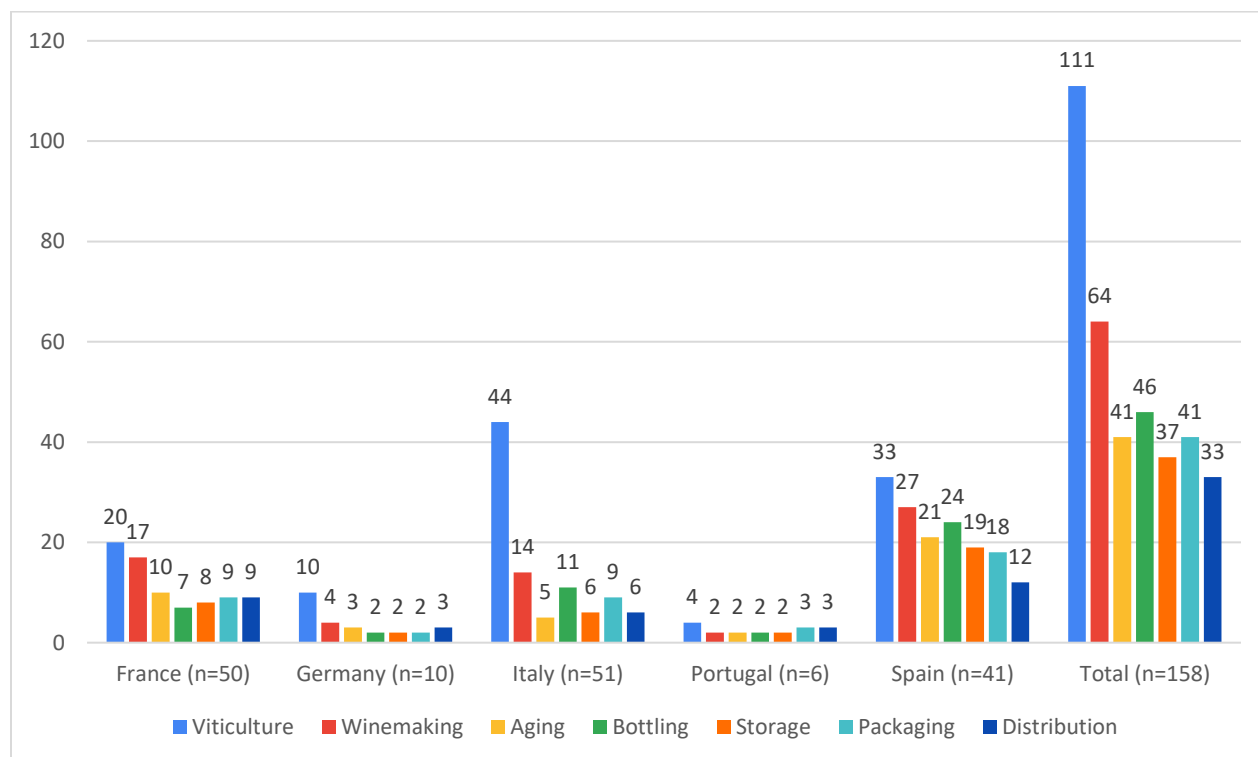
Figure 4. Since when has your organisation developed or adhered to a sustainability initiative? (n=113)



Scope – If one considers the **topics** covered by the different sustainability initiatives identified across the five countries in study, **environmental issues** of relevance to the wine supply chain stand out more prominently than economic or social aspects. Effectively, ‘soil’ (n=94), ‘landscape’ (n=93) and ‘biodiversity’ (n=91) are by far the topics most recurrently addressed by the initiatives identified alongside with ‘pesticide use’, ‘water use’, ‘nutrients and fertilisers’ and ‘herbicide use / prohibition of weeding in between rows’. On the contrary, ‘fair trade’ (n=20), ‘changes to bottles’ (n=25), ‘reusable packaging’ (n=26) and ‘good working and housing conditions for all (including seasonal) workers’ (n=27) are amongst the least covered topics.

Furthermore, Figure 5 below provides an overview of the **stages of the wine supply chain** covered by the sustainability initiatives identified through the survey. Overall, **viticulture** is by far the stage of the wine supply chain most frequently covered (111 initiatives, corresponding to 70% of the total number of the initiatives mapped out), followed by **wine-making** (64 initiatives, corresponding to 41%). Conversely, distribution is the least covered stage at present (only 33 initiatives, corresponding to 21%). Analysing the results by country, for all countries analysed, viticulture is the stage of the supply chain most covered. In fact, in Germany all initiatives identified cover viticulture, while the percentage of initiatives covering it is above 60% in Portugal and 80% in both Italy and Spain. Spain has the largest number of initiatives that cover stages of the wine supply chain other than viticulture.

Figure 5. Sustainability initiative: Which of the following stages of wine production does the initiative cover? (n=158)



Additional relevant findings – Based on the analysis of the specific sustainability initiatives identified through the online survey, one of the main findings is that **very few of those initiatives are being implemented or developed by PDO wine groups across the countries studied or even within them.** The implementation of organic viticulture and agro-environmental measures together with the participation in specific environmental certification programmes (e.g. Equalitas in Italy, HVE in France etc.) are some examples of sustainable initiatives undertaken by more than one PDO wine producer group. Based on the feedback received through the online focus group, the **fragmentation** that characterises the way in which the European wine appellation sector currently approaches sustainability has **multiple causes**. The most prominent among them is possibly the **high level of differentiation** that historically exists between wine-producing regions in Europe, leading each region to interpret and embrace sustainability in ways that best suit local needs and constraints.

It is also notable that only few of the initiatives mapped out through the survey are, in fact, implemented by **all** the wine-growers who are members of a PDO wine group. These include the following:

- The adherence to one or more **agro-environmental measures** from the protocol established by the *Institut National de l'Origine et de la Qualité* (INAO), which several PDO wine producer groups in France require of their members (e.g. AOC Costières de Nîmes et Clairette de Bellegarde, AOP

Côtes du Jura, AOC Touraine etc.);

- The environmental certification **HVE3**, which the ODG des AOC Médoc Haut-Médoc Listrac-Médoc in France requires all its members to obtain; and,
- The sustainability certification **Equalitas**, which Consorzio Del Vino Nobile Di Montepulciano in Italy requires all its members to obtain.

4.1.5. Sustainability initiatives in the European wine appellation sector: the future scenario

The findings emerging from the online survey indicate that, in the coming years, PDO wine producer groups in Europe are very likely to maintain their **sustainability focus on environmental issues** affecting viticulture and, more in general, the wine supply chain, rather than on economic or social ones.

More precisely, Figure 6 shows that, across the five European countries studied, the sustainability aspects to which PDO wine producer groups intend to allocate more resources in the future are:

- *‘Preventing harm to the natural environment while producing the wine (e.g. reduction of pesticides, fertilisers, water, no in-row weeding etc.)’* (78% of the respondents);
- *‘Protection of biodiversity and the landscape’* (70%); and,
- *‘Use of natural means of resistance to climate change or pests (e.g. experimentation of wine varieties, use of more robust plant varieties etc.)’* (51%).

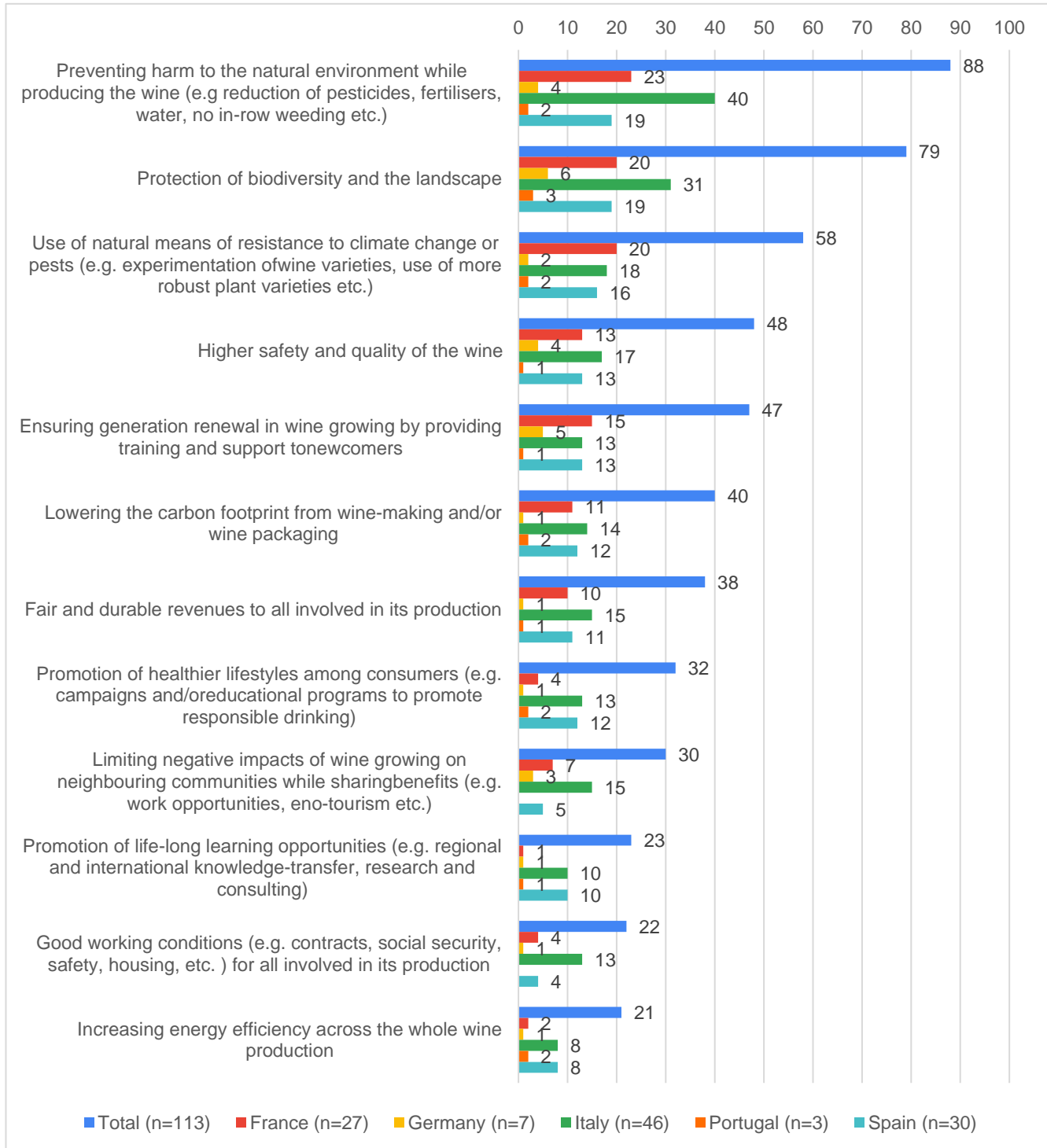
Conversely, the sustainability aspects that do not necessarily constitute a future priority for PDO wine producer groups are:

- *‘Increasing energy efficiency across the whole wine production’* (18%);
- *‘Good working conditions (e.g. contracts, social security, safety, housing, etc.) for all involved in its production’* (19%); and,
- *‘Promotion of life-long learning opportunities (e.g. regional and international knowledge-transfer, research and consulting)’* (20%).

Analysing the results obtained by country, these confirm the emphasis that PDO wine producer groups intend to give to environmental protection in the context of their sustainability agendas. Accordingly, the sustainability aspect to which PDO groups from France and Italy intend to allocate more resources in the future is *‘preventing harm to the natural environment while producing the wine (e.g. reduction of pesticides, fertilisers, water, no in-row weeding etc.)’* (namely, 85% of the respondents in France as opposed to 87% in Italy). In the case of Germany and Portugal, the sustainability aspect to which PDO groups plan to allocate more resources is the *‘protection of biodiversity and the landscape’* (86% in Germany, 100% in Portugal). Finally, in Spain, *‘preventing harm to the natural environment while producing the wine (e.g. reduction of pesticides, fertilisers, water, no in-row weeding etc.)’* alongside

'protection of biodiversity and the landscape' are the aspects to which most national PDO groups envisage to allocate further resources in the coming years (63%).

Figure 6. In the coming years, which are the sustainability aspects to which your organisation plans to allocate more resources? Why? (please indicate up to 5 aspects in total) (n=113)



4.2. State of play by country

4.2.1. France

France presents a wealth of sustainability initiatives, some of which established for a long time, with many more recent or developing initiatives. The overall picture that emerges is one of **fragmentation**, with most initiatives specific to particular groups of producers. However, **two strong trends** in France are contributing to **some convergence**.

The first trend is the ambitions set by PDO groups to have all of their members adhere to a common framework. Since these groups tend to be very large – e.g. Bordeaux, Champagne, Medoc and Listrac – they are contributing to the spread of sustainable practices to a critical mass of producers, even when adhering to the framework is voluntary rather than mandatory. The second trend is a supportive public/private framework, represented by a set of two protocols drawn by the INAO (*Institut National de l'Origine et de la Qualité*) that incorporate practices that can be included into a PDO's specification. These protocols include a number of sustainable practices and provide as such a guide that is being increasingly used by PDO groups to transform practices while maintaining PDO certification. Furthermore, the introduction of a public certification scheme, the **Haute Valeur Environnementale (HVE)**, provides a graded scheme for scoring agricultural practices that has become a reference against which earlier private certification schemes such as **TerraVitis** have converged. This supportive policy environment at national level is sometimes (and increasingly) reinforced by regional policy support or encouragements, to align local and regional agriculture with principles of resilience and climate adaptation. As such, policies signalling support for sustainability initiatives in wine production interact with market trends and provide a set of increasingly convergent incentives or nudges to producers.

Among the certification schemes found in France, it is worth mentioning the following initiatives:

- **TerraVitis**¹⁰ – The Terra Vitis association was founded in 1998 to set a framework for sustainable viticulture. It has evolved over time to incorporate elements on biodiversity, water, soil, energy management and social and economic standards. Its rules on the use of phytosanitary products have evolved over time to progressively restrict more substances. It has recently evolved to match the most demanding, outcome-based indicators of the Haute Valeur Environnementale level 3 (**HVE3**) (see below). 1,300 wine producers are TerraVitis certified;
- **Haute Valeur Environnementale (HVE)**¹¹ – HVE was introduced in 2012 as a recognition for the highest level of environmental certification in France. By contrast to less demanding certification levels, HVE sets requirements in terms of outcomes rather than inputs. As such, it has set a high target that the likes of TerraVitis have sought to match. A target of HVE certification of 50% of all

¹⁰ General link available at <http://terravitis.com/>

¹¹ General link available at <https://hve-asso.com/>

wine producers by 2025 has been set. A guide has been produced specifically for wine producers to facilitate this effort. Wine producers certified HVE are found across many PDO groups, such as Médoc, Côtes du Rhône, Grands Vins de Bordeaux or Jura. In Bordeaux, 2,200 producers were HVE certified in 2020;

- **Vignerons Engagés en Développement durable**¹² – Started in 2010, this certification and label offers a corporate social responsibility framework for wine producers that is structured onto the ISO26000 norm. Its scope covers both environmental, social and economic dimensions of sustainability. In 2021, around 6,000 producers and their staff were participating in the programme;
- **Viticulture Durable en Champagne (VDC)**¹³ – VDC certification was introduced in 2014 by the Comité Champagne. The underpinning standard covers a wide range of sustainability dimensions. That includes recent developments on variety development to improve resilience to climate change. The objective set for the VDC is to have 100% of Champagne producers certified by 2030;
- **Agriculture Biologique (AB)**¹⁴ – The AB certification and label was created in 1985, establishing requirements for organic production in various sectors. Specific rules apply to the wine sector. It is a widespread certification in the wine sector and across PDO producer groups, for instance in the Jura and Bordeaux (1,034 producers certified or in the process of being certified in the latter in 2020).

A number of initiatives do not correspond to a dedicated certification programme yet provide frameworks to drive the implementation of sustainable practices, supporting for that matter a process that may lead to certification. These are:

- **INAO Protocols**¹⁵ – In 2017 and 2018, INAO validated two protocols. The first specifies eight (and eventually nine) agro-environmental measures for wine production (grass cover on the edges of the fields, prohibition of chemical weeding anywhere, grass cover within ranks, optimisation of spraying, reduction of the quantities of phytosanitary products used, limitations to nitrogen input, preservation of walls, hedges, trees, bushes, prohibition of changes to the morphology of the soil, prohibition of plastic covering). The second establishes an allowance for PDO wine producers to experiment with varieties selected for the purpose of adaptation to climate change, reduction of fertilisers and pesticides, reduction of alcohol level or rehabilitation of native

¹² General link available at <https://vignerons-engages.com/>

¹³ General link available at <https://www.champagne.fr/assets/files/Developpement%20Durable/flyer-viticulture-durable-en-champagne-fr.PDF>

¹⁴ General links available at <https://www.inao.gouv.fr/Les-signes-officiels-de-la-qualite-et-de-l-origine-SIQO/Agriculture-Biologique> and <https://www.agencebio.org/>

¹⁵ General links available at <https://www.inao.gouv.fr/Espace-professionnel-et-outils/Produire-sous-signes-de-qualite-comment-faire/SIQO-et-engagement-dans-l-agro-environnement>

varieties. Producers are allowed to experiment with those varieties within the limits of 5% of plantations and 10% of the final blend. These measures can be and have increasingly been incorporated into PDO specifications, e.g. in Jura, Arbois, Médoc, Anjou, Saumur, Savoie, Bordeaux, Côte du Rhone, etc.;

- **Plan Carbone Champagne**¹⁶ – This initiative aims to reduce carbon emissions from the Champagne sector. It started with an assessment of the carbon footprint of the whole sector in 2003. 16 research and development programmes and around 50 actions have been completed, ongoing or planned. The objectives are multifarious, aiming to tackle carbon emissions at multiple stages and levels. The initiative has set different targets in terms of carbon footprint reduction and is aiming for a 75% and preferably an 80% reduction by 2050;
- **Système de Management Environnemental des Vins de Bordeaux (SME)**¹⁷ – SME provides a framework for Bordeaux wine producers to become more sustainable. This follows the ISO14001 standard and aims to eventually lead to HVE certification for all participants. Participation is voluntary.

Finally, one finds a wide variety of smaller initiatives springing from smaller groups of producers, regional and local authorities, or spearheaded by research funding provided nationally or by the EU. These initiatives cover a wide range of themes: energy use, recycling, training, fair pay, tourism, plant health, landscapes, among others.

4.2.2. Germany

Over the last years, a number of different sustainability initiatives have emerged in Germany, mainly consisting of sustainability certification programmes, occasional regional fundings to adhere to these programmes, networks allowing information and knowledge sharing and research projects. Of the different certification initiatives currently present on the German market, the following stand out:

- **Ecovin certification**¹⁸ – Created by the Federal Association of Organic Viticulture (ECOVIN), ECOVIN certifies organic and sustainable winegrowers in Germany. The compliance with EU organic legislation is mandatory but stricter criteria apply. All wineries are controlled by independent and accredited inspection bodies. Currently, some producers from 12 PDO wine regions - that is all German PDO regions except Hessische Bergstrasse - have obtained this certification;

¹⁶ General link available at <https://www.champagne.fr/fr/developpement-durable/defi-energetique-climatique>

¹⁷ General link available at <https://www.bordeaux.com/fr/Vignoble-engage/labels/le-systeme-de-management-environnemental-du-vin-de-bordeaux-sme-2>

¹⁸ General link available at https://www.ecovin.de/wp-content/uploads/2021/05/ECOVIN_Richtlinie_2021_15.Fassung.pdf

- **Ecostep wine certification**¹⁹ – This certification results from the cooperation between the Hessen Environment Alliance and the Geisenheim University of Applied Sciences. The integrated management system EcoStep wine is essentially based on the core requirements of ISO international standards, namely: ISO 9001:2015 quality management, ISO 14001:2015 environmental management, ISO 22000:2018 food safety and ISO 45001:2018 occupational health and safety management. EcoStep wine label is currently used by around 50 wine-growers and sparkling wine companies in Germany;
- **FAIR'N GREEN e.V.**²⁰ – This certification programme was created by Athenga GmbH, a spin-off of the Berlin Denkbank. FAIR'N GREEN e.V. is a seal / logo for sustainable viticulture. It helps winegrowers to objectively measure and verify sustainability goals and achieve them collectively. FAIR'N GREEN is an international certification programme: besides Germany, wine companies in Austria, France, Israel, Italy and Switzerland have adhered to the programme. Currently, in Germany some producers from 9 out of the 13 PDO regions have adhered to the programme; and,
- **Fair Choice Certification**²¹ – Funded by the German Federal Agency for Agriculture and Food in 2010 and implemented by a team of experts from science and practice from the German Institute for Sustainable Development at Heilbronn University. It consists of a seal / logo that identifies agricultural products issued from sustainable production. The certification programme comprises 44 criteria covering ecology, economy and social issues, which are based on the UN Global Compact and the Global Reporting Initiative (GRI). Currently, some producers from 7 PDO wine regions have obtained this certification. However, this is an international initiative and is not only found in Germany.

Also related to certification, there exists occasional specific regional public funding to support small wine-growing businesses on the path to certification that attests the implementation of sustainable practices in viticulture. This is the case of the programme **Sustainable management in viticulture ('FöNaWein')**, which supports certification for the reinforcement of the operational sustainability of wineries in Rhineland-Palatinate.²² Under this programme, all the certifications listed above are currently eligible for funding save for Ecovin certification. However, the licensing authority may, on the basis of pre-established criteria, include additional certifications in the list of eligible certification programmes. Currently, six out of 13 PDO regions have adhered to this initiative.

¹⁹ General link available at <https://www.ecostep-wein.de/>

²⁰ General link available at <https://www.fairandgreen.de/>

²¹ General link available at <https://www.fairchoice.info/>

²² General link available at

https://mwv/wl.rlp.de/fileadmin/mwkel/Abteilung_2/8206/09_Nachhaltiges_Wirtschaften/FoeNaWein/Foerderrahmen_26.02.2021.PDF

Moreover, in Germany, there are also some initiatives that are based on networks with the aim to exchange knowledge on topics related to viticulture and sustainability, among others. One concrete example is '**Netzwerk Lebendiger Weinberg**'²³ (Lively Vineyard Network). This network shares and makes available information on previously tested ways in which sustainable viticulture can be successfully implemented, while protecting local fauna and flora. It brings together actors from the various areas of viticulture, homeland maintenance and landscape conservation, as well as environmental and sustainability education.

In Germany there are some ongoing research, development and innovation projects with a focus on sustainability that may benefit from the direct or indirect participation of PDO wine producer groups. Some concrete examples are:

- **VinEcoS**,²⁴ whose main objective is to create innovative and climate adapted viticulture methods while contributing to higher biological diversity and optimised eco-system services in the vineyard; and,
- **Sustainable viticulture with weed protection through biodegradable mulch mats in the Saale-Unstrut wine-growing region**,²⁵ whose main objective is to demonstrate the use of mulch mats from the vineyard campus as weed protection on sample areas of the Freyburg-Unstrut winegrowers' association and the Pforta monastery winery.

4.2.3. Italy

With France, Italy is the country where the **highest number of sustainability initiatives** have been developed and implemented so far **across the wine sector as a whole**. Based on the desk research carried out during the study, there are currently around 34 sustainability initiatives in that sector at country level, although few of them have gained today an international dimension (this is the case, for instance, of the private certification programme **Equalitas**²⁶ and **VinNatur**,²⁷ the movement for the promotion of 'natural' wines).²⁸ Also, in March 2022, the Italian competent authorities approved the technical specifications ('*disciplinare*') regulating the certification system for the sustainability for the wine supply chain.²⁹

²³ General link available at <https://umweltakademie.baden-wuerttemberg.de/lebendiger-weinberg>

²⁴ General link available at <https://www.life-vinecos.eu/en/objectives/index.html>

²⁵ General link available at <https://www.technologiepark-weinberg-campus.de/en/news/nachhaltiger-weinbau-nicht-nur-f-r-die-saale-unstrut-region>

²⁶ General link available at <https://www.equalitas.it/x>

²⁷ General link available at <https://www.vinnatur.org/en/>

²⁸ A previous study carried out on the Italian wine sector mapped 15 sustainability certification programmes in 2014. See *Primo Rapporto sulla Sostenibilità del Vino - Verso EXPO 2015*, Ottobre 2014, available at <http://www.vinosostenibile.org/wp-content/uploads/2014/10/Primo-Rapporto-Sostenibilita-del-Vino-Ottobre-2014.pdf>.

²⁹ Decreto MIPAAF n. 124900 del 16 marzo 2022. See also <https://www.federvini.it/normative-cat/4160-pubblicato-il-disciplinare-di-certificazione-della-sostenibilita-della-filiera-vitivinicola>

With regard to the **wine appellation sector**, the online survey performed during the study revealed that several members of the local PDO wine groups are taking part in some of the sustainability initiatives mapped through desk research, while other PDO wine groups have developed, or are in the process of developing, their own initiatives, actions and/or plans. This ultimately results in a relatively **high degree of fragmentation** in terms of sustainability initiatives carried by the operators of this sector in Italy, which, overall, is consistent with the findings reported at the end of Section 4.1.4. for the European wine appellation sector as a whole. Furthermore, most of these initiatives have been undertaken by the local PDO wine groups over the last decade or in the last 2-3 years and generally tend to focus on viticulture with the other stages of the wine supply chain being covered to a more limited extent. Still 23% of the Italian PDO wine groups that took part in the survey had not undertaken any sustainable initiative by the time the survey was closed.

Against this background, based on the survey findings, amongst the sustainability initiatives that the members of more than one PDO wine group in Italy have joined. the following ones can be singled out:

- **Equalitas** – This is a sustainability certification programme that was launched taking stock of the technical knowledge gained over time through the Forum Sustainability Wine and the project Tergeo. The certification is based on a sustainability standard for wine producers that covers the three pillars of sustainability - notably, environmental pillar: use of sustainability indicators for biodiversity, water and carbon, and implementation of good agricultural and wine-making practices; economic pillar: good business practices and good economic practices for workers and suppliers; ethical and social pillar: employees' rights, training and community relations. The standard underpinning the initiative is developed and updated by technical committees, gathering representatives from the scientific community, wine producers and consumer groups. Once the certification is obtained, sustainability is communicated to final consumers via a logo / mark. The certification can be obtained for the wine as a final product but also for the organisation and management of the company producing it. Some members pertaining to the local PDO wine groups Consorzio Prosecco DOC, Consorzio Barbera d'Asti e Vini del Monferrato as well as Consorzio di Tutela Doc Castel del Monte have been granted Equalitas certification. As already referred under Section 4.1.4. of this report, in the case of the PDO group Consorzio del Vino Nobile Di Montepulciano, all members / growers are required to obtain this certification;
- **Biodiversity Friend**³⁰ – Biodiversity Friend is a sustainability certification programme managed by the Italian NGO World Biodiversity Association. Established in 2010, the certification programme targets all agri-food products, including wine. While there is strong emphasis on preservation of biodiversity and the natural environment, social and economic sustainability are also among the

³⁰ General link available at <https://biodiversityassociation.org/en/what-we-do/projects/biodiversity-friend/> and link to the technical protocol: <https://biodiversityassociation.org/en/what-we-do/projects/biodiversity-friend/standard/>

main objectives of the certification programme. Farmers and growers who fulfil the programme's sustainability standard / protocol can display the respective logo on their products. Compliance with the standard / protocol is verified by independent accredited certifying bodies. Some members of Consorzio Tutela Vini DOC Arcole, Consorzio Tutela Vini DOC Lessini Durello and Consorzio Tutela Vini DOC Soave are amongst the local PDO wine producers who obtained this certification;

- **Organic** – Few local PDO wine groups have reported adherence by some of their members to the organic standards set out by EU legislation. This is the case of Consorzio di Tutela dei vini di Torgiano and of Consorzio di Tutela Cerasuolo di Vittoria DOCG;
- **Soilution Systems** – This is a project that has been financed through the Rural Development Programme of the Veneto Region and that essentially aims at developing innovative solutions for mitigating the risks for viticulture deriving from soil erosion and for a better management of vineyards located in hilly and mountainous areas. Consorzio Tutela Vini DOC Lessini Durello and Consorzio Tutela Vini DOC Soave are amongst the partners promoting this project.

Notwithstanding the above, there are other sustainability initiatives identified through desk research that need to be mentioned in this context, as they bear specific relevance for the national wine appellation sector. These are:

- **V.I.V.A. Sustainable Wine**³¹ – This sustainability certification programme was launched in 2011 under the aegis of the Italian Ministry of the Environment (now the Ministry of the Ecological Transition) and in collaboration with the wine sector and two university research centres. Its main objective is to provide a common approach to measure the environmental, economic and social impact of viticulture, based on four main indicators (notably, water, air, vineyard and territory). After being piloted for few years, the initiative has been fully operational since 2014, although it has undergone few changes / updates over time, including the integration of a certification activity performed by a third-party entity (SQNPI). The latest revision of the technical protocol ('Disciplinare VIVA 2.1') took place in 2019. V.I.V.A. certification can be obtained for wine as a final product but also for the organisation and management of the producing company. Based on desk research, in 2021 8 PDO wines had obtained VIVA certification corresponding to 5 PDO wine producers;
- **SOSStain**³² – SOSStain is a sustainability certification programme targeting viticulture in the Sicilian region. It is currently managed by a foundation promoted by two wine local entities, i.e. the PDO

³¹ General link available at <http://www.viticolture sostenibile.org/Home.aspx> and link to VIVA general guidance on sustainability viticulture: http://www.viticolture sostenibile.org/Downloads/Linee_guida_sostenibilita.pdf.

³² General link available at <https://www.fondazione sostenisicilia.it/> and link to the technical protocol: <https://www.fondazione sostenisicilia.it/disciplinare/>.

group Consorzio di Tutela Vini DOC Sicilia e Assovini Sicilia. A Scientific Committee, composed by academics, and a Technical Committee, gathering representatives of the regional wine sector, contribute to the development, maintenance and update of the certification programme. The programme is underpinned by a technical protocol setting 10 minimum requirements that must be met to obtain the certification. SOStain works in synergy with V.I.V.A. Sustainability Wine certification program: to obtain SOStain certification and label, wine producers must meet the above referred indicators currently established under V.I.V.A.. SOStain is open to all wine producers located on the island, regardless the specific method of production used in the vineyard (e.g. conventional, integrated, organic, biodynamic etc.);

- **VinNatur** – As already anticipated earlier on, VinNatur is an initiative that was launched in 2007 in Italy, but that has evolved over time and now groups winegrowers of several European countries with the aim to promoting the production and the marketing of 'natural' wines. These are wines that are produced with minimal human intervention. In the absence of a regulatory definition of such wines, natural wines are generally produced from organic or biodynamically grown grapes. Grapes are hand-picked, use of sulphites strictly limited and no sugars, foreign yeasts or bacteria can be used. In 2016 the association published a technical protocol called 'Procedural Regulations for producing VinNatur wines'. Subsequently, an agreement with the certification body ValorItalia was concluded entrusting that entity with auditing powers. More recently, in 2020 the association eventually decided that producers who have been members for at least two years can display VinNatur logo on wine labels as a guarantee of quality for consumers. Currently, several Italian PDO wine producers are members of VinNatur, including producers of Montepulciano and Trebbiano d'Abruzzo, Taurasi, Aglianico, Nero d'Avola etc.

4.2.4. Spain

Compared to other countries such as Italy and France, Spain presents a **lower number of sustainability initiatives** in the wine appellation sector. In fact, one of the findings emerging from the online survey is that Spain is the country with the highest percentage of PDO wine groups that have not yet developed or adhered to a sustainability initiative (37%). However, it also emerges that Spain has the **largest number of defined but not yet tested initiatives**, which might mean that, in a few years from now, the wine appellation sector in Spain could have a comparable situation to that of other countries in terms of sustainability initiatives.

Even so, the first wine specific certification programme in Spain dates back to 2015. Back then the Spanish Wine Federation (*Federación Española del Vino*, FEV) established an accreditation system for sustainability called **Wineries for Climate Protection (WfCP)**.³³ WfCP is a certification programme that

³³ General link available at http://www.fev.es/sostenibilidad-medioambiental-vino/wineries-for-climate-protection/que-es-wfcp_295_1_ap.html

addresses environmental sustainability for the wine sector as a whole setting out specific environmental criteria that sustainable wineries must meet in four key areas:

- Reduction of greenhouse gases;
- Water management;
- Waste reduction; and,
- Energy efficiency and renewable energy.

This certification also fosters the collaboration between a series of independent certifiers while encouraging wineries to work towards continued improvement. Currently, this certification is held by 38 wineries, including some wineries pertaining to PDO wine producer groups (e.g. PDO Jumilla, PDO Uclés, etc.).

ECO-PROWINE³⁴ is another wine certification initiative initially established in Spain, but which has now a more European dimension. This initiative was originally created by the Circe Foundation in 2012 with European fundings and lasted three years. In 2020, this initiative was relaunched. In practical terms, ECO-PROWINE is an environmental sustainability seal / logo, which attests a winery's commitment to environmental sustainability. Currently, 90 European wineries, 18 of which located in Spain, including PDO wine producer groups (e.g. Grandes Vinos of PDO Cariñena), have obtained the ECO-PROWINE certification.

In recent years, national competent authorities in Spain have also developed some sustainability programmes, although so far none that is specific to the wine sector. In 2014, the Spanish Ministry for the Ecological Transition and the Demographic Challenge created a registry – the so-called '**Registro de Huella de Carbono**'³⁵ – which accounts for the efforts of the Spanish organisations of all sectors in calculating and reducing greenhouse gas emissions. In 2017, the Spanish Ministry of Agriculture, Fisheries and Food created a programme – known as '**Programa de Sostenibilidad Integral de la Industria Alimentaria**'³⁶ – which made available to the food industry a set of tools, including an online calculator to measure the overall sustainability performance of a company. Based on the desk research conducted, it is not possible to establish whether and to what extent such tools are currently used by PDO wine producer groups in the country. Also, none of these initiatives was mentioned by the PDO wine groups that took part in the online survey and, therefore, one could safely assume that they are not highly relevant to the wine appellation sector at this point in time.

³⁴ General link available at <http://ecoprowine.org/>

³⁵ General link available at https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/que_es_Registro.aspx

³⁶ General link available at <https://www.mapa.gob.es/es/alimentacion/temas/industria-agroalimentaria/sostenibilidad-industria/>

Atrias (Grouping for Integrated Treatments in Agriculture) are another type of sustainability initiative, not specific to the wine sector, in which PDO wine groups may participate. Atrias are entities constituted by owners of agricultural holdings to guarantee, among others, consumer safety, respect for the environment, sustainable use of pesticides and promotion of integrated pests management. Currently, CRDO Campo de Borja coordinates five Atrias. Based on desk research and online survey, it was not possible to identify any other PDO wine groups participating in this initiative.

In Spain, the participation of PDO wine producer groups in research, development and innovation projects with a focus on sustainability is relatively high when compared to the situation observed in the other countries covered by the study. There are currently several projects related to sustainability that benefit from the direct or indirect participation of PDO wine producer groups. Some concrete examples are:

- **Life Priorat + Montsant**,³⁷ whose main objective is to develop and implement a large-scale model of sustainable wine production in the region of Priorat (participation of PDO Montsant);
- **Life Sarmiento**,³⁸ which consists of an innovative solution for pruned vine shoot management aimed at climate change mitigation (participation of PDO Bullas); and,
- **VINYSOST**,³⁹ which revolves around the sustainable management of wine production in large vineyards (participation of PDO La Rioja Alta).

In Spain, in recent years, certain PDO producer groups have also started developing their own sustainability initiatives for the benefit of their members. This is the case of the '**Plan para la protección y potenciación de viñedos viejos y centenarios**'⁴⁰ and the '**Calculo Huella Carbono Vinos DOP Montilla-Moriles**'.⁴¹ The first consists of an ambitious plan to protect and enhance the quality of the grape and to adopt sustainability measures in the PDO Rioja region. The second is a tool that allows calculating the carbon footprint of the wine supply chain to be used by PDO Montilla-Moriles members. Also, there is a very recent pilot project in Spain led by Unión de Agricultores y Ganaderos de Navarra called **Smart Sustainable Wine**, which consists of an intelligent management system to improve the sustainability of the wine sector in Navarra. This initiative is based on a web platform to support decision-making adapted to the reality of small and medium-sized wineries in Navarra.

Against this background, it can be concluded that in Spain, at present, there are not many sustainability initiatives with a high level of participation by local PDO wine producer groups. With the exception of some specific certification initiatives - notably WfCP, which has the participation of more than one PDO

³⁷ General link available at <http://www.lifeprioratmontsant.eu/>

³⁸ General link available at <https://lifesarmiento.eu/en/the-protected-designation-of-origin-vinos-de-bullas-is-25-years-old/>

³⁹ General link available at <http://viny sost.com/>

⁴⁰ General link available at https://www.riojawine.com/wp-content/uploads/2021/03/Plan-Estrate%CC%81gico-DOCa-Rioja_Presentacion_2021.03.29.pdf

⁴¹ General link available at <https://www.montillamoriles.es/Documents/huella%20de%20carbono%20mas%20informacion.pdf>

group - almost all the other initiatives that were identified during the study are undertaken or promoted by a single PDO.

4.2.5. Portugal

Compared to all other countries covered by this study, Portugal still has a **low number of sustainability initiatives** undertaken by, or available to, the wine appellation sector. The number of these initiatives has been growing and last year several projects were defined and are currently **under development and/or implementation**. These include:

- **Implementation of smart sustainable plans in the Douro Demarcated Region, including online calculation of the carbon footprint and management of water resources** – This is an ongoing study being developed by IVDP launched in 2021 via the signature of the Declaration for the Sustainability of the Demarcated Douro Region. The Declaration commits to elaborate a series of projects consistent with the protection of the regional heritage, economic sustainability as well as to preserve the region’s biodiversity. The objective of these plans include: (i) primarily, to identify the Sustainable Development Goals (SDGs) of the United Nations that are most important for the socio-economic and environmental development of the Douro Region, and major contributors to the vine and wine chain processes in the region to address those SDGs, as well as identify key changes needed to be implemented in the associated chains-of-value to attain the SDGs; (ii) recognise the interdependence of the Green Deal with the economic development of the Douro Region, and the identification of the key measures in the vine/wine industrial sector with a view to making families settle in that region and increasing the local indicators of economic development; (iii) by combining efforts of the main Portuguese universities in this field, Douro Region private sectors and the IVDP, to identify the current state of the art of environmental and socio-economic sustainable development for this region, and integrate the new climate change data for Douro Region (a climate change “hotspot” regarding the impacts on viticulture); (iv) apply more than a hundred of key indicators (covering water, soil management, agrochemicals use, energy, landscape valorisation, etc.) in different areas from viticulture to wine transport, including the provision of an online tool for the calculation of the carbon footprint, and contribute to the development of a sustainability plan for producers, capacity-building to face climate change, innovate on circular economy, and further develop certification strategies;
- **WINEVOLUTION – Green Deal Strategy for Douro and Porto Wines** – This is a project to be financed by the national environmental fund and which is framed as an action supporting the overall strategy for the economic valorisation of local ecosystems and climate mitigation and adaptation in the Douro region;

- **'PRR – Projeto Integrado da Fileira da Vinha'** – This is a project whose primary focus is the implementation of an integrated approach to the wine production chain and for which funding opportunities are currently being sought for;
- **Sustainability Strategy for the Vinhos Verdes Region** – This is a project developed by Vinhos Verdes Region Viticulture Commission (CVRVV), which consists of an environmental, economic and social sustainability plan for Vinhos Verdes region.
- **VINEPROTECT** – This project involves northern Universities and private companies in the Douro Region and compares sustainable soil and water management practices in the Douro Region terroir. It also monitors the use of local vine-microbiome (local genetic banks) and impact on grape and wine characteristics, improvement of the vines' resilience to climate change (heat and water deficit), together with circular-economy on the terroir.

In addition, a national Interbranch Organisation (ViniPortugal) and the national Wine and Vine Institute (IVV) are currently developing a **National Certification Programme** for the wine sector as a whole, which is expected to be ready later this year.

With regard to the sustainability initiatives that are already **fully operational** in Portugal, '**Programa de Sustentabilidade dos Vinhos Alentejanos**' should be singled out.⁴² This programme is a pioneer initiative in Portugal and consists of a voluntary wine certification. The programme provides its members with a tool to assess the current state of their activities and gives recommendations in terms of best practices that can be implemented to increase the sustainability and the competitiveness of wines produced in the Alentejo region. Currently, this programme accounts for 430 members, including local PDO wine producers.

In Portugal, there is also a sustainability initiative named **Sustainwine**.⁴³ This initiative was created in 2020 and consists of an environmental education programme, which has the objective to raise awareness about the natural heritage of Portugal and promote knowledge about the conservation of nature and biodiversity of the vineyard.

Also, in Portugal there is a non-profit association named **PORVID**⁴⁴ that was established in 2009 with the objective to preserve and valorise the genetical diversity of traditional and autochthonous vines in Portugal. The association systematically carries out studies on vines to assist national wine-growers in carrying out the optimal varietal selection in terms of efficiency, resilience and sustainability.

Finally, an international initiative known as **Porto Protocol**⁴⁵ was also launched in Portugal. This is a pact that any winery can make with itself to improve its way of operating, notably by committing to making changes to its practices so as to mitigate the negative effects of climate change. On a broader

⁴² General link available at <http://sustentabilidade.vinhosdoalentejo.pt/pt/programa-de-sustentabilidade-dos-vinhos-do-alentejo>

⁴³ General link available at <https://www.advid.pt/pt/sustainwine>

⁴⁴ General link available at <https://www.facebook.com/porvid.portugal/> (all communications are done through Facebook page)

⁴⁵ General link available at <https://www.portoprotocol.com/>

scale, this initiative connects the wine industry through an on-line think tank, where information and case studies can be shared on a global scale.

Against this background, compared to the other four countries under study, it can be concluded that Portugal is still at an early stage in terms of implementation of sustainability initiatives in the wine sector as a whole. However, as shown under this section, there are several initiatives underway that may be implemented in the next few years that may bear relevance for the wine appellation sector too.

Section 5: The EU's sustainability agenda and the wine appellation sector

The current sustainable agriculture and food systems agenda at EU level is putting practices within all agricultural production sectors, including wine, under a new lens. The **2020 European Green Deal** has established a major commitment at EU level to make the EU's economy sustainable, in particular its agricultural sector and food systems.

The policy debate is being structured around three main policies:

- The Farm to Fork Strategy;
- The Biodiversity Strategy; and,
- The new Common Agricultural Policy (CAP).

The **Farm to Fork Strategy** articulates together within a common sustainability framework a set of policies and objectives that had largely been approached separately until then: nutrition and public health, consumer information, environmental impacts of the agri-food chain, climate change mitigation and adaptation, biodiversity loss, fairness and competitiveness. The leading policy project underpinning the Farm to Fork Strategy is a **legal framework on sustainable food systems**, which will likely include a widely encompassing sustainability labelling component. Whether wine will be incorporated into such a framework is unclear at this stage. The importance of **health and nutrition** in the EU's approach to sustainability, and the extent to which this will be balanced with other EU objectives, such as the protection of traditional foods and drinks, may mean different things for the European wine appellation sector. The efforts made within some sustainability initiatives to better inform consumers about sustainable consumption, and to limit the alcoholic content of wines (e.g. through the use of alternative varieties) echo measures anticipated in the new CAP 2023-2027 regarding partially or fully de-alcoholised products and consumer information on the nutritional content of wine products.

Commitments towards **environmental protection, climate mitigation** and addressing **biodiversity loss** (notably through the **Farm to Fork Strategy** and the **Biodiversity Strategy 2030**) are directly relevant to the wine sector. This encompasses two complementary perspectives on agriculture:

- A negative one, focused on reducing the negative impacts on ecosystems, particularly through reduction in the use of pesticides and fertilisers; and,
- A positive one, whereby agriculture is providing positive services such as the preservation of wild flora and fauna, the prevention of soil erosion, carbon sequestration or the regeneration of rural economies.

These orientations, in particular on the topic of pesticides use, point to a major change in the principles guiding EU policies. The long-standing approach to pesticides regulation in the EU, whereby substances were deemed safe to use if risk assessed and the conditions of their use established, is being revised. Instead, the focus has (partly) moved to **reducing volumes and risks of pesticides in absolute terms** and within very short timescales. Targets on the reduction of pesticides and fertilisers use and the very short deadlines attached to them are likely to trickle down and be increasingly used in conversations between public authorities and producers. This raises the question of producers' ability, including within the wine appellation sector, to address these requests with evidence of reduced use. A number of sustainability initiatives documented in the present study have been anticipating such conversations by recording their progress on pesticide and fertiliser use and aiming for further achievements within short timescales.

The services rendered by producers are the other, positive side of the sustainability agenda in EU policy today. **Ecological services** have a major role to play, but it is not the only one, with EU policymakers using a broad understanding of sustainability that also includes social and economic dimensions in rural parts of the EU. Such elements are announced as significant components of the new CAP 2023-2027. Producers that are already engaged in actions to enhance biodiversity, for example by leaving sections of the land uncultivated and un-weeded, as is the case through a number of initiatives documented in the present study, find themselves at the forefront of such efforts. Climate adaptation is also an important component of the new CAP, incorporating elements of experimentation with hybrid vine varieties within a PDO framework. This has already begun at national level, as documented in this study, with the INAO dedicated protocol in France.

It is thus at multiple levels that the current EU policy agenda echoes the breadth of sustainability initiatives seen in the European wine appellation sector. Building on this observation, we discuss in the following section what the way forward may be for producers of PDO wines.

Section 6: Sustainability in the wine appellation sector: the way forward

In a rapidly and dramatically changing policy and climate environment, the European wine appellation sector can build upon a **wealth of experience and experimentation**, as described in earlier sections of this report. That experience can help the sector as a whole to become more sustainable, through mutual learning and emulation. It can also position the sector as a source of inspiration and tested solutions for policymakers at a time when there is considerable interest and pressure to reform policies affecting agricultural practices, both at EU and national level.

The direction of travel of current policy efforts is clear, with major emphasis being put at EU level on **climate change** mitigation and adaptation, **waste and recycling**, **biodiversity loss**, **consumer information**, **health**, and an **economically sustainable agriculture**. The flurry of policy activity to turn sustainability goals into action provides a window of opportunity for the European wine appellation sector to play its part. At the same time, the process for driving greater sustainability in the wine appellation sector needs to recognise the wide diversity of the sector, that is, the needs and constraints of small wineries and the peculiarities of the terroirs. This points to the importance of ensuring a policy environment that recognises and supports **solutions adapted to local contexts**, rather than a one-size-fits-all approach.

The sector can contribute with ideas not only on the means for achieving sustainability goals, but also on the process for reaching these goals. Indeed, the initiatives that have been already tried and tested by members of the sector in Europe **can teach much** about the value of guidance, certification and labelling, the inclusion of sustainability goals and requirements into PDO specification or into dedicated sustainable development plans, the benefits of working with education and research institutions, the role of private and public funding support, and the need for mutual learning events and networks. They show the power of well-designed voluntary frameworks, but also their limits. They demonstrate how a progressive dynamic of ever-increasing ambition, with evolving targets, may drive progress at pace while ensuring buy-in from producers themselves.

By their **economic relevance**, **collective approach and presence on the territory**, PDO wine groups should be seen by EU and national public authorities as strategic partners that need to be included in the design and implementation of current and future policy actions in sustainability. In fact, PDO wine groups will necessarily be at the forefront of the ongoing ecological transition. By their inherent link to a given terroir, PDOs **will not be able to relocate elsewhere**, being compelled to adapt their production systems to eliminate or minimise any negative impact on the environment.

Although operators are responsible for implementing sustainability measures, PDO wine groups can play an important role in facilitating the development of a sustainability culture within its operators.

The PDO wine group **participative approach which promotes joint actions** and **the uptake of best practices** may contribute in stimulating operators to take charge and elaborate a sustainability programme - via the product specification and/or protocols - by using tools and support available in the Common Market Organisation Regulation (EU) No 1308/2013 and Strategic Plans Regulation (EU) 2021/2115.

PDO wine groups can be **more active** on sustainability by:

- Raising awareness and sharing best practices;
- Identifying knowledge gaps and training needs;
- Searching for available funding support;
- Developing specific tools (ex. resistant varieties experimentation, market observatory, voluntary raisin price guidance etc.);
- Reducing costs and image building;
- Encouraging networking; and,
- Including sustainability elements in their specification and/or developing protocols.

PDOs allow for a plurality of sustainability practices and encourage operators to work together for the success of the product.

Section 7: Conclusions

This study has documented that **several sustainability initiatives** have been undertaken to date, most of which during the last decade, and others are under development within the European wine appellation sector, with certain countries being more advanced than others in the implementation of sustainability practices.

The analysis of the initiatives shows that PDO wine groups seem to have placed more emphasis on the environmental dimension of sustainability than on other sustainability aspects, a trend which is likely to continue in the future. Likewise, most initiatives focus on viticulture while other stages of the wine supply chain are concerned to a more limited extent, though with some differences across the countries studied.

The sustainability initiatives mapped by the study **only rarely** are **undertaken collectively** (i.e. by

several PDO wine groups across countries or even within the same country or, within a single PDO group, by all of its members). This therefore has resulted in a plethora of different initiatives that, at this point in time, are not developed and/or carried out under a common framework or following a shared approach to sustainability. Such fragmentation is not a trait that is unique to the wine appellation sector insofar as the wine sector as a whole lacks, in fact, a common approach to sustainability.

The reasons behind the fragmentation of sustainability initiatives, are **multiple**, but primarily result from:

- The **lack of a shared understanding of the concept of sustainability** across that sector, which can be in part attributed to the absence of a clearer legal definition of what sustainability means in concrete terms;
- The **high level of differentiation** that exists historically between the various wine-producing regions in Europe, which tends to favour the adoption of sustainability practices and solutions that best suit local needs and constraints; and,
- The fact that sustainability is still largely perceived by PDO wine producers as a **differentiating factor** that may contribute to increasing their competitive positioning on the market.

Despite the current fragmentation, the **wealth of know-how and experience in the field of sustainability** gained to date by the different actors of the European wine appellation sector constitutes a valuable starting point and asset for the achievement of the EU's sustainability agenda and related operational targets. Besides, because of the inherent link they have with a given terroir, PDOs will not be able to relocate elsewhere, meaning that they have to adapt their production systems to eliminate or minimise any negative impact on the environment. From this perspective, PDO wine groups will be then at the forefront of the ongoing ecological transition.

Against this background, PDO wine groups can and should act as **levers for sustainability**.

Ongoing studies at national level seem to confirm the need for PDOs to play a more active role in mainstreaming sustainability across their membership.⁴⁶

As collective organisations, in the future their mission should include sharing, promoting and communicating on the best sustainability practices to their members. In parallel, new advisory services should be set up with a view to encouraging and supporting individual operators to develop more sound practices. In this context, PDO wine groups could also define broader sustainable action plans or

⁴⁶ See, for instance, the preliminary conclusions of *Estudio de sostenibilidad medioambiental de las denominaciones de origen de vino en España*, CECRV, Barcelona Wine Week, March 2022.

strategies, with clear milestones and objectives, to be reviewed and assessed at regular intervals.

Finally, as this study has documented, PDO wine groups can now **integrate sustainability** practices and/or criteria in their respective specifications and/or protocols. This is unique to GI wines and offers a strong leverage to ensure a rapid and wide uptake of sustainability initiatives in PDO wines. However, a clearer definition of sustainability at EU level is needed to ensure the uptake of that approach across the wine appellation sector.

Today, therefore, the European wine appellation sector is a key interlocutor for policymakers and other stakeholders of the agri-food chain alike for the definition of an ambitious and realistic sustainability policy framework at EU level that considers the diversity and the traditions of the different agricultural terroirs and practices across the EU.

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