

Digitalisation of wine production in France

This policy brief presents the results of interviews and workshops with stakeholders carried out in the Living Lab (LL) Inno'vin, in the Nouvelle-Aquitaine Region, France. The scenario question of this LL was: **"What will French viticulture look like in 2031 in connection with the digital evolution?"**

Within this context, two scenario narratives were elaborated. The "better not best" (BnB) scenario considers a very diversified supply of digital technologies, the acceptance of certain technologies, effective training on digital technologies and data management, and the implementation of digital wine production technologies with positive socioeconomic and environmental impacts. The "worse not worst" (WnW) scenario considers a very diversified supply of digital technologies, the acceptance of some non-intrusive technologies, basic training on digital technologies and data management, and a clear digital divide regarding the implementation of digital wine production technologies. Five central policy recommendations are provided based upon the suggestions of the scenarios.

CONTEXT

The LL Inno'vin is a wine cluster which brings together nearly 180 industry players. It supports companies in their innovation projects and has successfully supported more than 100 projects since 2010, with the aim to find solutions to overcome challenges in the wine sector. Inno'vin promotes the competitiveness of companies in the wine industry, and contributes to their economic development and maintaining of leadership position.

The objective is to understand the stakes of digitalisation in the wine value chain as well as the impacts and local needs for policy-making. Digital technology is considered as a tool that can address multiple challenges or needs. The French wine sector focuses on two main challenges: (1) agro-ecological transition for vineyard with a reduction in pesticides use and lower environmental impacts and (2) the competitiveness of French wines in national and international markets, with digitalisation driving the renewal of links with consumers and the disintermediation.

The wine industry, like agriculture in general, has been digitalised very quickly (CAP declarations' dematerialisation, weather stations, GPS) and continues to be digitalised, mostly using basic and generic tools. However, for several years, the dissemination of digital technologies relating to vineyards has been slowing down due to the specific characteristics of the sector. Well adapted digital tools are not yet available on the market (in most cases, the innovations are still at the prototyping stage).

At the upstream of the value chain there are several adoption levels for digital tools, depending first on the geographical indication and then on the type of vineyards belonging to financial groups or families. Downstream, traders have been investing in digital technologies for marketing and sales for years, while producers are new on this question.

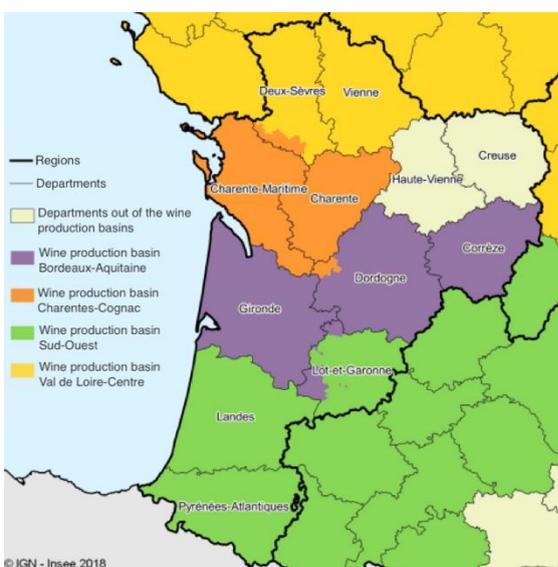


Figure 1. Wine production basins in Nouvelle-Aquitaine
Source: INSEE, 2018

RESEARCH APPROACH

The scenario question discussed with stakeholders in the two workshops is as follows: **“What will French viticulture look like in 2031 in connection with the digital evolution?”**

The stakeholders involved included farmers, cooperatives, farmer unions, researchers, policy advisors, founders of Agritech start-ups and farm advisors.

These workshops followed the STEEP-methodology where the discussion focused on the Social, Technological, Environmental, Economic and Political aspects related to the impacts of digital technology.



AN OPEN AND PARTICIPATORY EXERCISE WAS CARRIED OUT WITH THE STAKEHOLDERS TO IDENTIFY THE DRIVERS OF CHANGE AND PLAUSIBLE FUTURE PATHWAYS

During the online scenario workshop held in January 2022, the elaboration of scenario narratives was carried out through defining drivers of change and identifying plausible future pathways.

First, the participants agreed upon the following finalised version of the scenario question: **“What will French viticulture look like in 2031 in connection with the digital evolution?”**

Accordingly, an open and participatory forecasting exercise was carried out to answer this question. The participants were able to identify the drivers of change and discuss the possible evolutions of those drivers.

Then, the LL team worked on two so-called intermediate scenarios (“better but not best scenario” and “worse but not worst scenario”) characterised by different and plausible evolutions of socioeconomic, environmental, political and technological drivers. Two extreme scenarios (referring to “utopian” and “dystopian” situations) were also depicted.

SCENARIOS DEVELOPED

Because we used the STEEP methodology, discussions went much broader than just digital technology and touched upon issues such as environmental policies and knowledge, as well as the broader power structure in the wine industry.

Domain	Drivers of change
Social	<ul style="list-style-type: none"> Demographics of the <u>viticultural</u> population Demand for a more environmentally friendly viticulture Acceptability of local residents on the contribution of new technologies in the vineyards Training of the workforce
Technological	<ul style="list-style-type: none"> Data sharing / Interoperability Access to technological developments
Economic	<ul style="list-style-type: none"> Globalization Vs Local
Environmental	<ul style="list-style-type: none"> Extreme weather events Carbon neutrality in viticulture
Political	<ul style="list-style-type: none"> Role of public authorities in the adoption of new technologies applied to vineyards Legislation on the management of the wine industry

Figure 2. Drivers of Changes identified
Source: Scenario workshop with partners of Inno’vin

In the “better but not best” (BnB) scenario, digitalization has improved the wine making process in France. At the upstream of the wine chain, it has helped winegrower’s adaptation to climate change, by allowing them to predict extreme weather events in advance, to manage and control what happens in the vineyards 24/7, to replace herbicides with automated weeding robots and to anticipate diseases more quickly. Wines are also more environmentally friendly than a decade ago and most wineries have managed to become carbon neutral. At the downstream of the wine chain, digitalization has been a catalyst for a better relationship with consumers, it has brought more transparency about the practices and improved the way wine is sold online.

In the “worse but not worst” (WnW) scenario, there is a low level of digitalization in the French wine industry for many reasons: The digital technologies have become more complex and expensive. The education system has not been transforming fast enough and students are not trained on the use of digital technologies. The infrastructure for data sharing is poorly developed and the winegrowers are reluctant to share their data. Being unable to make good use of digital technologies, many winegrowers cannot manage to keep the quality of their wine.

POLICY RELATED DISCUSSION

The discussion in the workshop around the drivers of change and challenges for French viticulture and wine value chain has helped to identify local needs for digital policy-making.

Among the drivers of change identified by the participants, first of all, the increasing social demands for a carbon neutral or environmentally friendly viticulture, and unpredictable trends of climate change and especially extreme weather events, are the most important motivating factors nowadays for agroecological transition in the wine sector. Digital policy can significantly influence on the level of digitalisation and its capacity to meet the social demands related to these issues. Meanwhile, public funding and other resources dedicated to environmental concerns can be mobilised for the development of digitalisation.

Second, public policy plays important roles in the adoption of new technologies applied to vineyards, including public funding to encourage the adoption of new digital technologies, legislation to permit, restrict or even ban the use of certain technologies under specific conditions, supports to guarantee equal access to technological developments, training of the workforce, regulation of data sharing and interoperability, and others.

Third, the acceptability of local residents on the use of new technologies in wine making should also be considered. Improvements can be made through policies promoting civil digital education, transparency of farming practices, and communication of the contributions of digitalisation with local residents and consumers.

Finally, the legislation on the definitions and standards of wine quality and classification is a peculiar but critical influencing factor for the wine sector. Efforts should be made to eliminate and prevent potential prejudice against using digital technologies, for example, in the evolution of the Protected Designation of Origin (PDO) system, and legislative restriction on industrial viticulture compared to the terroir viticulture.



POLICY-MAKING CAN BE VERY IMPORTANT FOR DIGITALISATION IN WINE SECTOR BY INFLUENCING ON THE DRIVERS OF CHANGE, INCLUDING NOT ONLY THE DEVELOPMENT AND ADOPTION OF DIGITAL TECHNOLOGIES, BUT ALSO THE SOCIAL ACCEPTABILITY OF USING DIGITAL TECHNOLOGIES UNDER SPECIFIC NATIONAL AND INTERNATIONAL SOCIO-POLITICAL CONTEXT.

The key challenges for Inno'vin mainly include the growing average age of people working in viticulture, increasing extreme weather events, rising social expectations for an environmentally friendly wine industry and growing attacks or lawsuits filed by NGOs or residents against farmers using autonomous machinery. The risks linked to digitalisation are such as unequal access to digital technologies because of differences in affordability and digital skills, data security problem, legislative restriction imposed on industrial viticulture using digital technology (e.g. no right to apply for certain labels), and others. The opportunity is that the currently rapid development of digital technologies has great potentials in contributing to meeting the social demands for environment concerns. The differences between the scenarios are mainly in their level and capacity of digitalisation (from low to high) facing the challenges and risks, however, the designing of scenarios also concerns trade-offs between different targets.



UNREALISTIC TO EXPECT PERFECT SOLUTIONS ADDRESSING ALL THE CHALLENGES AND RISKS, THE DESIGNING OF SCENARIOS HAS TO CONSIDER TRADE-OFFS BETWEEN DIFFERENT TARGETS.

In the case of Inno'vin, the most remarkable contradiction is that the development of highly intelligent digital technology is needed to be able to predict extreme weather events or achieve environmental goals, however, the lacking of younger population working in viticulture suggests that public aids should be first used to promote user-friendly simple technologies. Otherwise, there would be unequal access to digital technology between different types of vineyards.

The BnB scenario suggests a policy option emphasising on the training of farmers and communicating with residents and consumers to promote transparency of farming practices. The second priority is the development and promotion of high-performance digital technology. A diversified adoption of digital tools in different types of farms is accepted. The WnW scenario suggests the results of a weaker version of this policy option.



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POLICY OPTIONS

Encouraging the development and adoption of digital technology in viticulture and wine industry

- Providing public funding to research and innovation on digital technologies to reduce environmental impacts and carbon footprint.
- Encouraging research and innovation on digital technologies to strengthen the capacity to predict climate change and extreme events.
- Establishing legislative permission for farmers to do experimentation on the use of digital tools.
- Supporting farmers for the adoption of digital technology and to prevent potential risks.
- Promoting equal access to digital tools and technologies.

Increasing the number of farmers capable to use digital technologies

- Promoting professional education and youth engagement in agriculture.
- Improving the attractiveness of working in the wine sector.
- Developing appropriate training programmes for the older generation.
- Developing simplified or automated versions of the digital technologies.

Valuation and communicating on the contribution of digitalisation

- Labelling the contributions of digital technologies in reducing environmental impacts, improving carbon neutrality, etc.
- Communicating with residents and consumers on the advantages of using digital technologies.
- Developing participatory approaches (e.g. auditions) involving different stakeholders in order to prevent potential risks relating to digitalisation.

Influencing on national and international legislation on wine sector

- Promoting positive consideration of digitalisation in the definition and standards of wine (e.g. Protected Designation of Origin - PDO).
- Recognising the rightful place of industrial viticulture using digital technologies.

Promoting data sharing and security

- Facilitating data collecting and sharing between stakeholders and along the wine value chains.
- Creating an open data platform dedicated to the wine sector.
- Establishing regulation on data use and security.
- Establishing a standard of data interoperability adapted to the wine sector.

This policy brief is published in the frame of the EU-funded DESIRA project and aims to provide recommendations for policy-makers on how to support digitalisation in the context of agroecological transition in viticulture in France.

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