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# Climate change and adaptation: Alsace and Loire Valley vintners' challenging point of view<sup>1</sup>

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**Abstract:** Vintners are long standing observers of climate change effects on their vine and wines. They have also considerable practice in adaptation. When asked about climate change effects, they report the usual expected climate change effects but do all attribute them to the last 30 years long technical change instead of climate change. This technical change has transformed the wine-growing practices and led to a considerable yield decrease, which explains in their point of view the higher sugar content, the earlier harvest date which is on its turn accountable of the aromatic changes and a certain loss of balance in of the wines. They don't report global warming effects, but insist instead on the increase of the climatic hazards. The vintners are developing different ways of conceiving adaptation, which feed important disputes amongst them. Adaptation can be seen as compensation practices oriented by a predefined rigid objective, a more flexible accompaniment of the vine and more recently a new challenging view where it's to the vine to adapt. This last way consists in sheltering the vine from excessive climatic hazards, help it buffer its reactions to its environment, become resistant and produce a stabilized terroir quality wine.

**Keywords:** Vintners' perception; adaptation; climate change; technical change; terroir quality

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## 1. The perception of climate change by the « actors »

Why should we care about the actors' perception of climate change? Are the climate scientists and agronomists results not a good enough source of information? Yes it is. Yet the vintners can bring interesting additional information. They make precise observations in their vineyards at a very small scale compared to climatic models. In France, certain vintners have a longstanding experience; they have filled detailed climatic records and vine development observations since decades, sometimes since a century<sup>2</sup>.

Their observations can help the survey of the global warming progresses and provide detailed accounts of its effects on the vineyards. The vintners are indeed often good or excellent observers of all kinds of events and changes occurring within their vineyards. Furthermore they also must adapt every year to climatic changes, which makes them experts in climate change adaptation.

We can add another important reason why turning towards vintners for effects of climate change: as emphasized by some scholars (Jones et al., 2005), the effects of climate change may consistently vary with viticulture practices. So vintners appear as good interpreters of climate change effects namely because they have a consistent knowledge of their own viticulture practices.

We have conducted a field study mainly in two Northern French vineyards, Alsace and Pays de Loire, where we have interviewed 68<sup>3</sup> persons, mostly vintners, independent, cooperative employees or members, all making Protected Designations of Origin wines (PDO), but also PDO syndicates, National Institute for the quality and Origin (INAO) employees, journalists, wine retailers and researchers. These interviews have been completed by 3 other with winery technical staff members in Morocco and Argentina. The interviews have sometimes been repeated, up to 5 times, with the vintner so as to provide a more detailed understanding of his point of view. They have lasted in average almost 2 hours and have often been followed by a visit of the vineyard. The interviewees were all professional vine-growers, and were all have been chosen so as to be representative of all kinds of the diversity of the

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<sup>2</sup> The three vintners interviewed in Morocco and Argentina complained about the weather which was never as good as they wish, but did not share any sound analysis on climate change effects on their vines, maybe just because they did not enjoy any such long-lasting experience.

<sup>3</sup> Some of the contacted vine growers did not accept to be interviewed or were occupied or absent at the meeting. These vine growers were mostly cooperative members, which we suppose did not want to be interviewed.

profession: independent vintners, cooperative members, running small or big wineries, with different interests or conceptions regarding wine quality.

## 2. Vintners' observations & analysis

Nearly all interviewed vintners note an increase in climatic hazards, but no global warming effect. At first view they even appeared to be quite climate sceptics.

This result would be erroneously related to the geographical implantation of the Alsace and Pays de Loire. Indeed they all noted changes usually associated by scientists to global warming: an earlier harvest date, an increase in sugar content, aromatic changes, and sometimes but not for all wines, a decrease in acidity. Yet they all claimed these changes were due to technical or even commercial changes and not to global warming.

These vintners are therefore not climate sceptics, but critical observers of the changes occurring within the vineyards. In their interpretation, it's mostly the technical change aiming at quality improvement, which started in the 1990s and spread in all French vineyards, promoting yield decrease and a search for a better ripening of the grapes, which is responsible for the increase in sugar and the earlier harvesting date due to the lower fruit load. All these changes lead to a certain loss of balance in the different maturation processes regarding phenols, sugar and aromas. Since they relate these changes to technical change, they try to adjust their viti-viticulture practices. Some of them start to mention with extreme precaution a possible increase in their yields well below the PDO limits, so as to achieve a better convergence between the different maturation processes. Their main preoccupation is not to jeopardize the grape and wine quality they aim at.

Ligerian and Alsatian vintners do not stress any global warming effects; nevertheless they underline an important increase in climatic hazards referring namely to recent exceptional vintages such as the very hot 2003, 2009 or very cold and late 2010 or to 2013 disturbed by unusual heavy hail episodes. Some scholars may associate it to climate change, others to the vintners' increased concern for viticulture practices and the management of their impact on the vines. For many of the vintners these increased hazards are again not related to global warming. They follow continuous cyclic variations as shown in their weather records as well as the global assessment of the vintages with their succession of good and worse decades. They do not see anything new or exceptional here, and therefore do only exceptionally<sup>4</sup> include climatic change considerations when they plant new vineyards. Considera-

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<sup>4</sup> Two of the interviewed vintners had experimental vineyards with Southern grape varieties. One saw it as a global warming change adaptation trial.

tions about the height of the vines, their pruning, and the configuration of the canopy are always related to quality objectives.

Whatever the reason for their focus on climatic hazard, it stresses a particular vintners' interest towards adaptation, but a yearly adaptation, which resorts to an extensive array of old and new practices such as the thinning out of leaves, the increase of the soil surface albedo and management of the water resource and an increasing number of simplified cultivation techniques aiming towards non-cultivation techniques. The interviews gather a long list of such techniques, as well as demands for an enhanced flexibility of the PDO regulations, or new plant material. But these demands diverge considerably according to each vintner; they even raise considerable disputes amongst them. Some would ask for old traditional vine varieties "adapted" to the local conditions, while others expect new vine varieties or clones resistant to climatic hazards. All these answers depend strongly on the vintners' understandings of quality and adaptation.

### 3. How do the vintners adapt to the changes?

All of the interviewees showed considerable interest in quality<sup>5</sup> as well as strong discrepancies about the right understanding of PDO quality and the right way to adapt to climate variations so as to obtain a good PDO quality wine. Three different interpretations of quality can be drawn from the interviews. The two first ones result from a 15 to 20 years growing controversy on PDO quality. The third one seems to result from a new turn arising within this debate.

#### 3.1. *Adaptation as an objective oriented compensation or a development oriented support*

Viticulture and climate adaptation consists in the vines development management. These first two interpretations of adaptation can be compared with two opposite views on pedagogy. In the first one the objective to be reached is predefined and firmly hold during the apprenticeship and the efficiency of the learning techniques is constantly reassessed. They are improved or changed as often as necessary so as to get as close as possible to the objective. In the second one, the objective is constantly revised so as to adapt not only to the pupil achievements but also to the pupil, to its capacities and interests.

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<sup>5</sup> Possibly the vintners who refused the interviews were not so much interested in quality, or their interest could not be explained and made explicit as required in an interview. This does not mean that the vintners had no interest in quality or viti-viniculture practices.

In the same way, some vintners try to reach a production objective relatively firmly predefined according to marketing strategies and an estimation of the firm production capacities. The viticulture practices are assessed, revised and adapted according to the firm capacities, its work force, farming tools and financial possibilities namely.

Some vintners criticize this way of adapting. They denounce an excessive concern for the customers and their changing tastes and a lack of terroir authenticity. They plead for a higher respect of the vines terroir expression, which includes variations with the different vintage climatic conditions. They argue that terroir expression cannot be predefined and even less adapted to market fashions. On the contrary, it has to adapt to the development of the vine all along the vegetative cycle. They wish to allow a major place to the vine in the realization of the achieved quality. In order to do so, these third vintners resort to particular viticulture techniques: non-culture or as much as possible simplified viticulture practices and oenological techniques. They are not reluctant to vine-growing or winemaking techniques changes. But they require these innovations to be terroir oriented. As a consequence they prefer to turn towards neglected or complementary PDO traditional vine varieties, instead of varieties invented from scratch.

#### 3.2. *Deciding about PDO quality*

These two points of view feed important debates namely because each implies a different compromise on technical constraints and quality achievements. The first ones whose adaptation can be related to a compensation strategy aiming at compensating for the lacks and failures in the vine development, ask repeatedly for an increased flexibility in the production constraints so as to be able to always better achieve their production objective whatever the vintage conditions. The second on the contrary emphasize the need for strong constraints on viticulture techniques and most of all on oenological techniques so as to make sure that the vine development is not distorted and the wine processing does not spoil the grape quality with excessive vintner interventions. But they conversely request certain flexibility in the achieved result, as it's the terroir and therefore the vine the one who decides what quality has to be and not the vintners.

Although not always the case, the first view is usually supported by a higher number of vintners. But numbers are not a good clue for settling the dispute. Indeed both views are necessary for a collective successful adaptation: PDO names must be at the same time relatively rigidly tied to a certain identifiable PDO quality so that the name makes sense for wine drinkers. But at the same time, the referred quality must also be flexible enough so as to enable adaptation to a constantly changing world.

A third interpretation still in the making has recently appeared, could bring new arguments to the dispute. These third other vintners agree with the idea that the PDO quality has to be protected from the erroneous first vintners' conception of PDO terroir quality and the vine has to contribute to its definition. But the best way to avoid distortion in the yearly adaptation process is to foster another conception where the vine adapts itself to the vintage conditions, with ever less vintners' interventions.

### *3.3. It's to the vine to adapt!*

This third growing interpretation of adaptation cannot anymore be compared to a teaching method where the pupil would define the goal to achieve during the apprenticeship. The vine is not a pupil, it is an expert and the one who knows which and produces the right quality although for sure, it is unable to make it explicit. The vintner is necessary in the achievement of the terroir wine quality. He must to help the vines produce the best terroir quality grapes, but it has also to stay in the background.

Besides simplified cultivation techniques, which protect the wine terroir quality from excessive vintners practices, they try to shelter the vines from excessive climatic hazards by encouraging the vines to develop its roots in the deeper soil layers where far from the changing superficial changes, with stable water supply, temperatures and environment. They carefully avoid high yields, which make the plants sensitive to changes. Regarding the upper aerial part of the plant, they try to restore and develop the ecological network tying the plant to its environment and its web of interactions, which help the vine to buffer and compensate for the changes occurring in its environment. They look for resistant plants whose a stabilized quality is an important sign of the capacity of the vine to adapt by itself to the changes.

### *3.4. A new turn in controversies on acceptable quality variability*

Quality variability is of main concern for the study of climate change impacts of vine and wines. Indeed PDO regulation specifies not only restrictions on production practices but also on the achieved result. So that any change in the grapes or in the wines may induce problematic wines variability.

Wine diversity issues are not strictly restricted to climate change. The management of the wines variability has a longstanding history, which resulted in the creation of new wine definitions and classes, the wines Denominations of Origin ("simple" AO) with the French 1919 law (République Française, 1919), then the Controlled Denominations of Origin (AOC) (République Française, 1935) later transformed by the 2008 European reform (Commission européenne,

2008) in Protected denominations of Origin (PDO)<sup>6</sup>. AOC or PDO wine quality is a notion, which is never made completely explicit and only at most partially specified by a series of analytic criteria, with an allowed variation range, and a taste assessment, which allows for inexplicit variations. Conflicts about the acceptable diversity of the wines can be related to divergent views on the good ways to achieve AOC and then PDO quality. Climate change and the increased vintners focus on good climatic adaptation fuels the conflicts amongst the PDO vintners.

This last development in the invention of better terroir-oriented vine growing and wine-making practices is about to bring a new contribution to this controversy about authentic terroir quality production by introducing a new criteria in the assessment of the good adaptation practices: the stabilization of the terroir expression in the wines. Yet the decrease in diversity that can be expected from this focus on quality stabilisation only regards each vintner and its own brands, not the whole PDO production.

But the answer these last vintners are elaborating regarding adaptation issues is both challenging and innovative as it turns towards nature and no more only human technology to produce an adapted behaviour.

## **4. Conclusion**

Finally, neither global warming nor climate change is such a big issue for AOC vintners. The major changes they observe in their vineyards converge with the global warming expected effects. But in their view, they are the result of the practice change they have themselves fostered. Quite logically, they do not see adaptation as an issue; on the contrary, they say they can cope and actually cope with these changes, and do not ask for extra help. The impediments they underline regarding their vine growing and winemaking activities remain quite the same as ever and mainly depend upon the way the deal with terroir-quality and terroir-quality suited practices.

Should we conclude that vintners are not aware enough of climate change and most of all of global warming? Is it a risk that they will continue to contribute to an increasing global warming of the planet?

A large part of the interviewed vintners were quite green house gases emissions aware, and among them many of the vintners engaged in the second and third modes of adaptation as vine-accompaniment or vine-delegation. Some of them had even CO<sub>2</sub> emission free wineries. But this is

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<sup>6</sup> For a more detailed account of the history of the acceptable diversity assessment and management, please refer to (Teil, G., 2015b).

environmental awareness is not general and most surely related to our sample selection.

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