

## 18. Agricultural resilience and wine production: a value analysis

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### Abstract

Climate change presents the agricultural and agro-industrial sectors with formidable challenges in meeting the food demands of the world population. What could be the role of those agricultural productions with no or negligible nutritional value but high economic value, like floriculture and wine production? We look at the case of the wine industry and the role it may play in an agroindustrial sector that needs to tackle the challenge of feeding the world under climate change circumstances. The wine industry may be accused of competing with other more important agricultural products for land, water (at least in some countries), fertilisers, etc. while producing a luxury product with limited nutritional value, as well as producing considerable GHG emission per bottle (including the various stages of farming, winemaking and marketing). Yet, viticulture and winemaking may contribute to the resilience of local agricultural systems and provide inspiring examples, know-how and capital resources. The wine sector has a deep connection with locality, is considerably vulnerable to global warming and has repeatedly shown the capacity to be a fly-wheel for the local economy and its agricultural and tourist sector. These features may be important assets in boosting the resilience of local agricultural systems under global warming stress. I put forward some ethical commitments and conditions that concerned wine producers and consumers need to meet in order to contribute to the sustainability and resilience of local agricultural systems. Since the high economic value of wine is so closely intertwined with its cultural and symbolic value, success needs the joint effort of producers, consumers and wine critics, which share responsibility in reorienting the sector towards supporting agricultural resilience.

**Keywords:** food ethics, climate change, food scarcity, viticulture, sustainability

### Background and problem statement

We always need to remember that wine does not represent a fundamental good for human survival like protein, carbohydrates, lipids, therefore it needs a more advanced ethics of production. (Lorenzo Corino)

It is now widely acknowledged that climate change will have significant impacts on food security, although these impacts will be different according to the entity of climate change, to the timescale considered (less dramatic and widespread in the short term, potentially much more widespread and radical, but also more uncertain, in the long run), and to the different regions of the world (CCAFS, 2010; FAO, 2008). Instead of working under one specific scenario that would need accurate scientific backing, I will make some general assumptions that are fairly weak and seem in line with the scientific literature. The first assumption is that in the short term (2-3 decades) the most severe impacts will be felt by people working in the first sector in low income countries and by the urban poor, starting with those living in cities within low income areas. The second assumption is that in the longer term, as the impact of climate change become deeper and more severe, food security will require considerable shifts in food production patterns, new knowledge, methods and capabilities. The third assumption is that at some point in the future, uses of agricultural land that do not contribute to food security will need to provide convincing justification, at least from an ethical point of view. The last assumption suggests that a number of farmed products without significant nutritional value may come under scrutiny, and

that if the food security crisis reaches critical points, producers and consumers of these products may themselves feel that their production and consumption choices are ethically problematic or perhaps even just wrong and indefensible. This could be the case, for instance, for flowers, for spices and for beverages like wine and beer (although these are not without any nutritional value and in the past have been not negligible sources of calories and safe drinks when clean water was difficult to obtain). How strong the pressure on these products will be at different points in time is very difficult to foresee, for it depends on how adaptation to and mitigation of climate change will unfold and on political, economic and cultural factors. It is clearly possible that at some point the situation will become so critical that the question will not arise and conversion to different cultivations will be inescapable, as it is possible that other changes (e.g. dramatic improvements in food production efficiency, or sharp declines in population) will prevent the issue to emerge. However, this paper adopts the perspective of what may be called the conscientious wine producer and wine drinker: i.e. people who are interested in producing or consuming wine, but are very aware of the impact that climate change will likely have on food security and believe that the wine industry has a role to play in tackling this issue. So, the question that I ask is what will make possible for this fictional and ideal typical wine producer and wine consumer to feel at peace with their conscience. Answering this question is not only relevant for wine producers and consumers who identify with our ideal conscientious specimen but can also be relevant for agricultural policy making. The approach adopted here bypasses two other positions that I consider rather extreme: (1) the moralistic stance of those who may claim that in the face of the threat of malnutrition and starvation any use of land that does not maximise food production and availability is unjustifiable; and (2) the laissez-faire perspective of those who may claim that one should leave it to the market to decide how producers will use land in response to consumers demands (and hence that as long as demand for luxury goods will be there any interference with the free market is wrong or counter-productive).

## **Method**

The aim of the paper is to offer some normative suggestions on how viticulture and wine making should respond to the possible impacts of climate change on food security. The normative recommendations are the result of working out how a set of values can be sustainably honoured and realized within the current and prospective circumstances in which viticulture and wine making operate. Therefore, two steps are needed: one is to identify the set of relevant values, the other is to understand the relevant empirical circumstances in which wine producers and consumers operate currently and in the prospective future.

The first task is performed through a theoretical construct, namely the outline of the ethical perspective of two hypothetical moral agents: what I call the conscientious wine producer and the conscientious wine consumer. The conscientious wine producer (henceforth CWP) is constructed by attributing to her a set of professional goals and moral concerns. The professional goals are kept to a simplified minimum, namely the CWP wants to make its wine producing activity economically viable – in the sense of generating and preserving the resources needed for it to continue in the future (as long as natural and socio-cultural enabling conditions obtain) – and profitable. The moral concerns are also kept to a few simple but broad principles. The first is that the CWP wants to act in respect of laws, regulations and of the principle of offering to consumers a product which is safe and enjoyable. The second is that CWPs want to work in such a way that contributes to the mitigation and adaptation to climate change, as long as this is compatible with preserving wine quality and economic sustainability of their activity. This aspiration is seen as an ongoing task, not as something that implies a sudden and radical transformation, nor as something that can be achieved simply by making one change and thinking that having done this satisfies once and for all the task. On the contrary, every successful step leads to the question: what can I do next (presenting this principle as a linear temporal progression is of course another simplification to make the point clear: the CWP is not satisfied with a token achievement)?

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The conscientious wine consumer (henceforth CWC) too is constructed by attributing to him a goal and a moral concern. The goal is to continue to drink wines that give him satisfaction (hedonic and convivial value) while being prepared to adapt his consumption pattern, for instance through educating himself to different standards of wine appraisal, to reduce consumption and to be prepared to pay more. The moral concern is to support and encourage viticultural and wine making practices that contribute to climate change mitigation, adaptation and resilience.

It remains to understand the empirical circumstances in which wine producers and consumer operate now and in the prospective future. This could be an almost impossible task if interpreted as setting very detailed and accurate requirements, especially when it comes to future circumstances. What can be done in the context of this paper is to rely on the author's knowledge of the reality and main trends of vine growing, wine making and global wine markets acquired through some relevant literature (research done mostly while working on a biotechnology project on wine yeasts) and through his own two decades of experience as an interested and curious wine consumer. Moreover, I do not provide the empirical background at the outset. Rather, I take from the FAO (2008) framework document the three main dimensions of a response to climate change related food security and describe the implications for the wine sector on the basis of relevant knowledge of the circumstances of the sector.

### Responding to climate change related food security

According to an important document produced by the Food and Agriculture Organization of the United Nations (FAO) in 2008, a response to climate change threat to food security includes adaptation to changed climatic circumstances, increasing resilience to climate change impact and mitigating the driving causes of climate change, most notably through reducing greenhouse gas emissions. I will now try to illustrate what can be demanded to the wine sector in relation to these three dimensions.

#### Mitigation of climate change

I start with mitigation of greenhouse gases emissions. At all three stages of vine growing, wine making and wine marketing substantial amounts of greenhouse gases are produced and can be measured, for instance, in terms of carbon footprint (CF) (Scrucca *et al.*, 2018). Studies and forward-looking producers have shown that actions are possible to reduce these emissions. Hence it is easy to conclude that CWCs ought to work out a transition plan that could enable them to reduce the CF at all stages of the lifecycle of the product: from using less fossil fuel in the vineyard (e.g. by limiting the use of tractors) to packaging the final product in lighter and easily recyclable containers and privileging nearby markets. Parallel to reducing emission could be the effort of increasing carbon capture, a goal that can be achieved by adopting viticultural practices that abandon a monocultural approach to the vineyard that eliminates any other form of vegetation and by embracing instead a more biodiverse approach to vineyard management and a more promiscuous land use. This enables both an increase in carbon capture and a more sustainable type of agriculture that preserves the quality and productive potential of the soil, this latter is a result important also for climate change adaptation and resilience (Corino, 2019).

What are the implications of mitigation for the CWC? CWCs have a very important role to play. First, they need to demand transparent, accurate and truthful information about the CF of wine producers so that they can make informed choices that reflect and are consistent with their values. Second, they should be prepared to accept higher production costs and hence higher final prices, for mitigation may bring additional costs (at least in the short period). Third, they should be prepared to change their expectations when it comes to the packaging of wine and also to the taste of wine. However, it should be noted that more sustainable viticultural and wine making practices may be expected to have interesting if not downright positive effects on the organoleptic qualities of wine. But consumers may have to accept

less standardised taste and consistency. This is probably not something that would displease the wine connoisseurs, but may be more challenging for the less experienced, casual drinkers with a limited budget, who may not welcome the risk of spending money on a product that does not meet their expectations. In this respect, casual CWCs may need to adapt their wine taste and preferences to honour their ethical commitment. Yet, this taste adaptation can be consistent with an aesthetic appreciation of wine that is more subtle, authentic and aware of the connection between wine and the environment and climate that enable its production.

### **Adaptation to climate change**

Adaptation to climate change was defined by IPCC as 'Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (IPCC, 2001). In food production an important element of this adjustment is to change practices so as to prevent or mitigate the decline of food production and supply, as well as to protect ecosystems and preserve natural resources (FAO, 2008). These principles have some important implication for CWCs. The first is that they should not plant new vineyards on fertile farmland that is better suited to crops with high nutritional value. Vineyards do best in poor hillside soils that are often not ideal for other crops and in the face of the climate change related challenges to food security, an attitude of restraints towards planting new vineyards is required. Restraint that should not be limited to fertile farmland, but also to land whose current use provides high carbon capture, like woodland (while grapevines do capture some greenhouse gases, tending a vineyard produces more GHG than it is captured by the grapevine) or that have great biological value in that they provided the habitat to either endangered species or to species that play a fundamental role in the preservation of the local ecosystem. Another important implication is that the use of scarce or non-renewable resources in viticulture should be avoided or minimised. The most important and telling example is water for irrigation. CWCs should try to avoid irrigation as far as possible (the *Vitis vinifera* is a plant that copes well with water scarcity stress) and when this is not possible the most efficient systems of irrigation should be adopted, and no groundwater should be used. Moreover, CWCs should farm their vineyards so as to avoid soil deterioration and erosion, in order for the land to retain its productive potential and to be converted to food production should the necessity arise. Finally, CWCs should commit to minimize their GHG emissions, not only because they are responsible of climate change, but also because CO<sub>2</sub> is also very likely to be responsible for lowering the nutritional value of many crops and foods (Ebi and Loladze, 2019; Loladze, 2016).

Furthermore, viticulture and winemaking have so far benefited from warmer climate, but are now reaching the tipping point in many wine producing regions. This is pushing many producers to develop new approaches and techniques that can be inspirational examples for other production. Thanks to the high commercial value of wine and profitability of premium wines, wine growers have the resources to lead in this experimentation and adaptation practices. And the fact that so far, they have reaped benefits from climate change puts an extra moral demand on them to make a special effort to contribute to adaptation.

The implication for CWCs is that they should demand clear standards and certifications that enable consumers to be informed about wine producers land use, resource management and vineyard practices.

### **Agricultural resilience**

Viticulture and wine production can be economically very rewarding because premium wines command high prices on the market. This, together with the *V. vinifera* high productivity make wine an important resource for many farmers and for many agricultural districts. Furthermore, it has been shown that

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producing quality wines with a strong connection with the local *terroir* can promote tourism and the development of other high quality and profitable agricultural products. This can significantly enhance the resilience of rural areas and hence contribute to preserve adequate supply of food.

What are the implications for CWP and CWC? CWPs who have good profits should accept the responsibility of contributing to the economic sustainability of the whole farming district to which they belong. When their products achieve the level of attention and interest that attract visitors interested in quality products, they should try to promote the sustainable development of the whole local community, striving to use the new sources of income to promote more sustainable and resilient farming practices within their district. Since this kind of development brings with it the risk that a district enjoying increased opportunities to sell premium products may switch from basic crops with great nutritional value to luxury production that do not contribute to satisfying basic food supply, it is important that specialized luxury productions do not displace basic crops. This could be achieved by adopting the principle that the district output of basic crops is not reduced. In practice this means that it is acceptable to allow luxury production to take up land that was previously devoted to basic crops, only if the income generated by these production can support better farming practices that enable the total production of basic crops to either increase or at least not to fall below previous levels. These principles can be embedded in a concept of responsible local farming transition, whose ideal would be to reinforce the resilience, sustainability and adaptive capacity of farming districts while honouring the duty of providing a sufficient supply of agricultural products needed to ensure local and global food security. This duty needs to be interpreted against the background of a global division of responsibility in food production, so that every region is expected to produce its fair share according to its productive potential and the global needs.

CWCs have an important role to play. The principles laid out for producers would be much easier to achieve if consumers are not too subject to fads and ephemeral fashion, but try instead to appreciate deserving but less famous and fashionable areas, so that the benefits of a precious and profitable product like good wine are distributed more widely among the regions that have the potential to produce good and fine wines. A distribution of the benefits based more on the intrinsic value of the wine and less on the successful branding of few fortunate areas would also contribute to avoid generating the wrong incentive to plant too many vineyards in certain regions with a negative impact on sustainability and biodiversity. CWCs should also be prepared to accept that global supply of wine, and of cheap wine in particular, may decline because it is not compatible with sustainable farming practices.

Clearly other stakeholders, like wine critics and traders have important responsibilities in supporting a transition towards a more sustainable and responsible viticulture and wine making. Since wine has always had complex cultural and symbolic value, changes in production and consumption need to be accompanied and supported by steering wine culture in the desired direction, a task to which many stakeholders need to contribute. However, for the sake of simplicity I have here focused only on the role of producers and consumers.

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