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MASTER THESIS

How can wine tourism be a tool for raising awareness on climate change?

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Abstract

The great majority of scientists all over the world agree on the fact that climate change is one of the most important threats humanity is facing today, with its impacts expected to keep accelerating in the very close future. There are many factors causing climate change and can be both natural or human caused. The impacts are evident in every part of the planet and are highly affecting human life in numerous ways, among which agricultural production; hence, viticulture, as well. The vine is a highly sensitive plant, which responds to climatic changes by shifting its phenological cycle. These changes can have significant impacts on the final product, the wine.

Since climate change is only expected to be more intense in the future, impacts on wine are expected to be more evident, as well as the so called “bad” years, which tend to give a bad reputation to the wines they produce. The wine community is obviously aware of the problems faced, and is taking actions of both mitigation and adaptation. However, one of the most important actions to be taken is communication of climate change to the consumers, in order to achieve, among others, two objectives: to raise awareness on the problem and to prepare them and educate them on those years to come, so that they eventually stop seeing them as “bad”, but rather as “difficult”, or even better “interesting” years.

How could the wine tourism industry contribute to communicating climate change and its impacts on wine? A workshop and wine tasting is being organized, where wines from “difficult” years due to climate change, indicated by their own producers, will be tasted and discussed, while focusing on the fact that those years do not necessarily produce bad quality wines, but rather different wines, interesting wines, even great wines. For the purposes of the workshop this thesis is using three ways to collect information: research on climate change and its impacts on wine, research on how to effectively communicate the complex issue of climate change through wine to the non-expert public, field research by interviewing the producers to learn about their own experience with climate change. In the end these information will be used to prepare the workshop called “Great Wines from Hard Years”.

Keywords

Climate change, great wines, difficult years, climate change communication, wine tourism, consumer power

1. Introduction

This thesis was written during a wine tourism internship in La Banca del Vino, or The Wine Bank, which is situated in the cellars of a historical building, built by the family of Savoy during the 18th century, in the Roman town of Pollenzo. It was the idea of Carlo Petrini, the founder of the Slow Food movement and international organization for the promotion of good, clean, fair and healthy food, to create a place where the history of all the great Italian wines could be preserved, exposed and enjoyed for years to come. In 1997, and after raising an important capital, with the help of more than 200 public and private investors (today called Agenzia di Pollenzo), the historical building in Pollenzo was acquired and Petrini's idea became reality.

Banca del vino is part of an even bigger dream that Petrini had, that of turning Pollenzo into an important pole of attraction completely dedicated to gastronomy, including food culture, food education, hospitality, and wine. After a few years of restoration work, by 2001 Banca del vino was ready to open its doors. In 2004 and under the same roof, were also ready the Hotel of the Agenzia di Pollenzo, the restaurant of the Agenzia and the University of Gastronomic Sciences.

While the rest of the entities are private, Banca del vino is a cooperative among several wine producers, other companies and individuals. Today it is a Museum of Italian wine and also a place where several wine tourism and wine education activities take place. However, the most important project of Banca del vino always remains the creation and preservation of the history of Italian wine. According to this project, Italian producers, those already included in the Slow Wine Guide, a book published every year, featuring thousands of Italian producers that work with respect to the environment, to tradition and to human labor, as well as producing quality wines, can become members of this project of Banca del vino.

The producers donate to Banca del vino each year a number of bottles, from one or two labels, which are considered of high quality and worth aging. A part of these bottles is considered historical and cannot be used, whereas another part is donated in order to be used by Banca del Vino in its several activities and tastings, as well as for sale. A separate part is bought by Banca del Vino, including wines that are not meant to age, but are interesting and representative of the Italian wine diversity, also available for use and sale.

All the wines are exposed in the historical cellars, divided into wine regions and appellations, from the most northern part to the more south, together with a small description of the producer and a jar with a sample of the soil, from the vineyard where the grapes that produced this wine were grown, and several information regarding wine and wine making.

2. Duties and activities during the Internship

One of the very first tasks undertaken was the correction of all the language mistakes on the website of Banca del Vino. There were several inaccurate translations from Italian to English language, and the intern had to go through the website, identify them and correct them. Helping with English posts and translations remained a responsibility throughout the entire internship.

Banca del Vino offers its activities in Italian and English, but since the intern could speak also French, the tours and tastings were offered in that language, too. There is a wide range of activities offered by Banca del Vino apart from the basic tour in the historical cellars, accompanied or not by wine tasting. There are several workshops, all with a different topic, including a tasting of five wines, lasting at least one and a half hour. For each of those the intern would have to study on the topic, choose the appropriate wines among all the labels of Banca del Vino, study the wine characteristics and winemaking processes, as well as the producer's history, and prepare and guide the workshop. Up to three workshops would take place during some days, which meant a lot of studying and researching every single day. Preparing and guiding the tours and the workshops in all three languages, quickly became the intern's main task.

It was a very big challenge, not only because of all the different languages, with none of them being the intern's mother tongue, but mainly because of the unknown of the Italian wine world. Italy is considered by many among the wine community, the most complex country in terms of wine regions and appellations, but also in terms of varieties, with more than 350 autochthonous ones. Banca del vino's objective is to represent the most of this diversity, to an audience that can vary from simple tourists that tend to not know much about the subject, to wine lovers and connoisseurs that also make demanding and unexpected questions. In the end, apart from being the biggest challenge, this was also the biggest opportunity to learn in such a limited time so many things, about such an interesting, complex and historical wine producing country.

Another big challenge was the preparation and realization of a full day experience called "Introduction to the World of Wine". This includes a full introduction to the basic winemaking processes (white, sparkling, red and rose), from the vine to the bottle, accompanied by the tasting of 11 wines, paired with delicacies from Piedmont, and the basic wine tasting technics. The intern had to prepare the presentation slides, wines and tasting and provide the whole experience in an educative yet interesting way.

Wine sales and stock management of the wine shop where part of the everyday work. From advising the clients on Italian wines to making sure that bottles are displayed in the right way, that all variety tags and prices were updated, and that there were no empty shelves. Giving information about Banca del Vino and its activities, and making reservations for workshops, events, educative wine games and team building experiences were some other everyday responsibilities, together with the social media management, the preparation of the tasting room for either tastings, events or courses, as well as helping the producers by assisting and serving during the events.

However, the team of Banca del Vino works together in all of the everyday tasks that need to be done, so everyone was always involved, and helping in all of the responsibilities described above, which was the most important part of the work and also a very good example of teamwork and good communication. Most importantly, the intern was instantly given the support, trust and freedom of movement to take responsibilities and act autonomously. This was not only extremely appreciated, but also created the perfect conditions for significant learning and growing, even within this limited amount of time.

3. Basis of the Thesis proposal

Banca del Vino belongs to the wider family of the Slow Food Movement, hence it shares the same values and philosophy regarding food culture, from the producer to the consumer, and everyone involved in between. Some of the main arguments of Slow Food are the sustainable use of our natural resources, the protection of biodiversity and the general respect for the environment. There is an environmental impact in every step of food production, elaboration, transportation, distribution and consumption, from the agricultural methods used in the field, to the distance that products have to travel to be cleaned, processed and packaged, to the packaging material chosen, to the arriving to their selling points. After this point it depends on the consumer's choice whether he is going to buy this product or not.

The criteria according to which consumers make their food choices are numerous, can vary greatly from the one consumer to another, and have been researched and identified by consumer scientists. According to Jeffery Sobal et al. (2014) "Food choice is multifaceted as it involves whether, where, when, how long, how, why, with whom, for whom, and under what conditions eating occurs ... Food choice is multilevel as physical, biological, psychological, and sociocultural factors operate simultaneously and interact."

According to the Slow Food philosophy, consumer's choice is the key in changing the way we produce food. If more people decide to buy organic products, eventually more producers will turn to organic agricultural practices, as a response to the consumer's demand. Furthermore, within the Slow Food Movement the consumer is called co-producer, to highlight how closely related his actions of purchasing food are to the way they are produced. Carlo Petrini argues several times the power consumers have. "By being informed about how our food is produced and actively supporting those who produce it, we become a part of and a partner in the production process" (Popham, 2009), "True change can happen at the food table every day, if we use our purchases to support agricultural models which show concern for the land and those who cultivate it" (FAO, 2018), "Eating is an agricultural act", (Wendell, 1990), "and informed, discriminating consumers become co-producers." (John Irving-Slow Food Companion).

Wine is an agricultural product, by many even considered a food, and just like with every other food product consumers choose in a complex way. Consumers have the power to shape the market and point producers towards the right direction. Today more than ever, due to one of the biggest problems faced by humanity, that of climate change, it is crucial to demand more environmentally respectful ways of production, in every agricultural product, and of course in

wine as well. In order to achieve that we need informed and aware consumers, who are going to make better consumer's choices. Among the different ways we can use to inform consumers, wine tourism could be a very useful one. Tourists, who are probably already interested in wine, are visiting a wine related place in order to have a wine experience. This wine experience, according to where it takes place, can often have an educative character. Banca del Vino is a place of that kind, since the majority of its activities are aiming to educate visitors. Being also a member of the Slow Food family, it is the perfect place to talk about wine, climate change and sustainability all together.

The first global strike for the future, where Slow Food, the University of Gastronomic Sciences, and Banca del Vino attended in Torino, gave birth to many discussions, regarding how Banca del Vino could be more communicative of those shared ideas for the climate and sustainability. The question was "Do the people visiting Banca del Vino actually learn about the current problems of the environment and our food -and wine- production system? In the end, came the idea of creating a whole new workshop including tasting, focused on climate change and its impacts on wine.

3.1 The workshop idea

The workshop and tasting regarding climate change was going to be added to the aforementioned selection of workshops offered by Banca del vino, as a new activity, with about the same price, structure and amount of wines, however with two differentiations. The topic would be climate change, and the communication and tasting of the wines would be achieved by using the words and experiences of the producers themselves.

The goal of this workshop is to communicate the following ideas:

-Climate change is all around us; we should talk about it and make it mainstream. Dr. James McClintock argues, "If we can't even talk about climate change, we certainly will never be able to fix it." (McClintock, 2018). According to the researcher, conversation is the first and most important step towards actually being aware and taking action, it is the simplest and easiest thing just because everyone can participate in it, even people who do not believe in the subject, or believe but they feel unable to act.

-Agricultural production suffers the results of climate change. The vine, specifically, is a very sensitive plant, one that highly responds to climatic shifts, and that is evident in the final product which is wine.

-“Difficult” years, ones that need a lot of attention in the vineyard and the cellar, and are reputed of giving wines of inferior quality, have always been occurring, but they will be even more common in the future years due to climate change.

-“Difficult” years are not necessarily bad year (if bad years actually exist) and great wines can be produced even in those years. A wine that is not typical and consistent every year is not a bad wine, but rather a wine that expresses its vintage and terroir.

-Producers are facing climate change in their vineyards, wines and work, having to adjust and overcome many problems. It is important to know their side, in order to better appreciate their wines and the work behind them.

-Consumers should keep an open mind and accept wine for what it is, which is not a standardized industrial product; especially not when produced by small scale producers or when working with great respect to the environment.

-Consumers have the power to support the producers who are working with respect to nature and produce interesting wines, and at the same time provoke other producers to take environmental measures in their production, just by their purchase choices.

4. Methodological approach

Four basic steps were needed to be taken in order to support the preparation of the workshop:

1. To make a thorough research on the relation between climate change and the wine sector, in order to be able to clearly and confidently communicate the subject to the participants, in the introductory part of the workshop.
2. To make a thorough research on how to successfully communicate climate change to a “non-expert” public, in a way that is effective, interesting, engaging and aims to promote conversation and hopefully action, rather than confusion, doubt, fear and despair.
3. To contact winemakers who would be interested in giving their testimonials, regarding their very own experience of climate change in the vineyard and the cellar. Their words would be used by the presenter to accompany the tasting.
4. To select the wines to be tasted, according to the indications of the producers, and the availability of these wines at Banca del Vino during that time.

4.1 Research on climate change and its impacts on the wine sector

4.1.1 What is Climate Change

Even though climate change has been a field of academic research for more than a century, it is still hard for the scientific community to find a definition that they all agree on, since it is such a complex field that takes into consideration many different factors. This lack of a unanimously accepted definition creates a general confusion within the expert and the non-expert public, with the most common examples being the use of the words climate and weather as synonyms, as well as climate change and global warming as the same issue. (Werndl, 2016)

According to IPCC:

“Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use.” (V. Masson-Delmotte, 2018)

There are many different factors that cause climate change and those can be naturally occurred by volcanoes, tectonic movements, orbital variations, greenhouse gasses (with water vapour, carbon dioxide and methane being the most important) that are naturally emitted, a complex of

different features that the scientists call “feedback” (vegetation and ice sheets are two examples that feedback into the atmosphere, hence highly influencing it), and last, but not least, the human activity.

With the 20th century being the warmest of the previous 10 centuries, scientists have proved the relationship between the use of fossil fuels, and the increase of the temperature. Carbon dioxide emission due to fossil fuels, methane -especially from intensive livestock farming-, deforestation and monoculture are some of the examples of how human activity influences the atmosphere and takes part in accelerating climate change.

Rising temperatures, ice melting, rising sea levels, biodiversity loss, weather extremes (tsunamis, severe storms, hurricanes, heatwaves, droughts, wildfires) are some of the impacts of climate change on the planet. It is inevitable that all these impacts have an effect also in human life, from lives being lost due to natural disasters that are more and more often due to changing climate patterns, to the availability of water, to ecosystems’ health, to agriculture and food production.

4.1.2 The wine community

Just like agriculture in general, viticulture and finally wine production are highly affected by climate change. The international wine community seems to be very aware of the problems that need to be faced and only within 2019 there have been two events dedicated to climate change and its impact on the wine sector. Climate Change Leadership Porto - Solutions for the Wine Industry (CCL-Porto19) took place from the 5th to the 7th of March in Porto, Portugal, and the Symposium “The impact of climate change on vineyard management and winemaking” took place on the 14th of May, as part of the Vinexpo 2019 in Bordeaux, France.

CCL-Porto 2019

Different sectors of the wider wine community (such as agriculture, biology, ecology, sociology, economy) are joining their forces to find the best strategies to adjust to climate change. Pau Roca, general director of OIV, argues “The wine sector has never been in denial...Because (the) industry is very close to the territory, and we’ve been always seeing that here is climate change”. According to his words the wine sector, though small, could become an example of sustainability.

Adrian Bridge, CEO of Taylor’s Port, spoke of the importance of a collective effort. 600 delegates from 30 countries coming together to find solutions for the wine industry, is a proof of

how urgent it is to face this problem today. Furthermore, he explained why the wine industry should take the lead in tackling climate change, since it expands in many different sectors (viticulture, vinification, packaging, transportation, soil nurturing, consumers, etc.).

Vinexpo Symposium 2019

Philippe Mauguin, president of INRA (French National Institute for Agricultural Research) shares the results of their research conducted especially for the purposes of Vinexpo, where he reveals that the use of pesticides per year has been increased due to climate change, and that fruit, potatoes and vines are the productions that use the most of those phytosanitary products. He also reveals that agriculture contributes to 20% of France's greenhouse gas emissions, even if it only contributes to 2% in the national economy.

Miguel Torres Jr, on the other hand argues the importance of communication, and declares that within their strategy is to be sharing their own experience of climate change. Cristina Mariani-May also points out the importance of sharing information, knowledge and research, "It is also about the hospitality and opening your doors up to other people so that they can learn first-hand."

Other initiatives that prove the importance of the situation are the "International Wineries for Climate Action, founded by Torres and Johnson, aiming to challenge wineries to cut down their emissions by 80%, by the year 2045, through cooperation, shared knowledge and research.

Smaller scale initiatives are being born all over the world, just like the "Vendanges Solidaires", an association founded in France in 2016, by a small team of wine lovers, after learning about producers that were so much impacted by climatic extremes, that they had almost nothing to harvest by the end of the summer. The association raises money through different events and public fundraising, which distributes to producers that have lost more than 70% of their production due to extremes caused by climate change.

4.1.3 Basic impacts of Climate change on the wine sector

One of the primary impacts is seen on the phenological cycle of the vine. Veraison and ripening are occurring earlier due to higher temperatures and higher concentration of CO₂ in the atmosphere, resulting to grapes with higher concentration of sugars and lower acidity. Furthermore, since the maturation process is accelerated, and the harvest takes place earlier, the grape composition can often be unbalanced or produce wines that lack the complexity that grapes which undergo longer maturation normally show. High sugar concentration has a great

impact on the yeast population, leading to problematic fermentation (e.g. “stuck fermentation or high volatile acidity).

Phenological changes can also be seen earlier in the vines’ cycle, with warm temperatures arriving earlier in spring and waking up the vines, influencing plant’s productivity even later in the growing season, whether positive or negative due to different factors like exhaustion, or water shortage (Buermann et al., 2018). Moreover, early spring increases the risk of a phenomenon called “false spring” (Allstadt et al 2015), where suddenly low temperatures occur again after the early high temperatures, and freeze the new growth.

When speaking of “terroir”, we refer to the soil, variety, climatic conditions and viticultural practices that give to the wine it’s very unique characteristics. If one or more of these factors is in any way altered, then the resulting wine is affected as well. A wine of terroir, is a wine expected to express typical characteristics of its place of origin. However with climate change, this typicity is a subject to change. This leads to problems in the denominations, to rules that should be reexamined, and to consumers that the industry still cannot know with certainty, how they will react in products that have lost their typical character. Consumer’s demand and expectations as well as resilience and adaptation to the new reality should be considered, in the context of climate change. (Espinoza, 2016)

Insect populations are increasing, and the diseases caused by them are more severe. But extremities are observed in many other ways, too. Apart from very high temperatures, there are also extremely low temperatures, more unseasonal frosts and hailstorms, wildfires, hurricanes and other disasters that cause economical loss, not only because of decreased production but also because of destroyed vineyards, or no production at all.

Extreme drought and water shortage can lead to water stress in the vineyard which affects the capacity of the plant to photosynthesize, its’ most important activity to survive and grow. Even more it can lead to leaf damages and problems in grape maturation.

Predictions show that several traditional wine growing regions will not be able to produce in the future, while at the same time new wine growing regions will have optimum climatic conditions to start doing so. This has economic and cultural aspects for places whose economy, society and culture have been depending on wine and have been formed by its production for years.

4.1.4 Impacts of the wine sector on the environment

While it is important to evaluate all the impacts of climate change on the wine sector, it is equally important to evaluate the contribution of the sector itself to climate change and the environment in general. According to INRA, 83% of the New World land under vine is being irrigated, and according to the Water Footprint Network 120litres of water are required to produce 125ml glass of wine. (Johnson-Bell, 2019). Let alone the energy consumed in the vineyard (machinery) and in the wine cellar (temperature control, water pumps, press machines, bottling, etc.) as well as the wine transportation. Packaging is another issue that is being discussed, with heavy glass bottles having a high carbon footprint and waste, since they are not being recycled or reused. Herbicide use is not only bad for the ecosystem in and around the vineyards, but also causes soil contamination and degradation, as well as excessive treatments with copper (organic practices) that is toxic for the soil. Furthermore, vineyards, when grown as a monoculture, they contribute to the loss of biodiversity.

4.1.5 Opportunities and Adaptation

On the bright side, there are several opportunities for the sector, within this new reality of climate change. New geographical areas could become leading wine producers in the far North of the Northern hemisphere (UK, Scandinavia, Alaska) or the far South of the South hemisphere (South Chile or Tasmania), since the temperatures of these regions will rise to levels favorable for wine growing. Higher altitudes are also the next step for producers, in order to maintain freshness and acidity in their wines.

Revitalization of ancestral varieties and development of new ones that are later ripening and more resilient to diseases and water stress, is key in mitigating climate change, and also interesting for diversity in the wine production. For the same reasons there are opportunities for research and development regarding rootstocks and clones, or better adapted selected yeasts. Several adjustment can be done in the vineyard management, from the plant density, to leafing or not, to the training height and of course the harvest date.

At the same time new wine styles are immerging and with the right communications and marketing, consumers could appreciate and enjoy them. According to Antonio Amorim, millennials already make up for 42% of the wine market, and are a more aware market in terms of health and climate issues, and eager to always learn more. This is an opportunity for the business to promote organic and biodynamic wine, related to quality, since millennials are looking to associate themselves with a company that has values.

Regarding water shortage and drought, water storage constructions are very important, as well as a change in the irrigation systems. Many producers turn to drip irrigation, and also to the use of big data and smart systems to achieve precision in irrigation technics. Margareth Enriquez says that with drip irrigation they reduced their water use by 50%. Other constructions that worth investment could be hail nets for hailstorm protection and anti-frost mills for unseasonal frosts.

The wine sector is also starting to take care of biodiversity and ecosystems, by intercropping, cover crops and of course planting forests. Many producers are actually not only keeping forest vegetation around their vineyards but rather planting even more, just like Miguel Torres in Chile. Other innovative practices can include CCR technics (Carbon Capture and Reuse), recycling material like glass bottles, using mainly cork stoppers (according to Antonio Amorim corks emit 6% of the CO₂ they capture), or even building bioclimatic wineries like Christian Binner in Alsace and Papagiannakos in Greece. INRA is hoping to discover the secrets of the biological soil crust, in order to be able and use soil microorganisms to fight diseases and protect the plant.

One of the challenges for both the sector and the market would also be to adjust the appellations' regulation. Apart from the acidification, chaptalization, or dealcoholization rules, or the required wood aging time, new varieties are starting to find their ways into prestigious appellations, with Bordeaux being such an example (Deitch, 2019).

However one of the biggest opportunities for the wine world, which is already taking place, is the collaboration between all the sectors involved in wine, for a common cause, mitigation and adaptation to climate change.

4.2 Research on how to communicate climate change

According to the Head of Communications of the Climate Outreach, Dr Roz Pidcock, "Climate science is filled with uncertainties, a notorious stumbling block for communicating with non-scientists. For some, the topic can seem abstract and intangible. For others, the abstract statistics that define the climate discourse can feel distant from their day-to-day experiences." (Corner, 2018). In 2018 and after the request of the Intergovernmental Panel on Climate Change (IPCC) scientists, Climate Outreach created a Handbook of "Principles for effective communication and public engagement on climate change", including the following six main principles.

1. Be a confident communicator

It is very important that the presenter knows their subject very well. This is why research on climate change in general, and its impacts on wine has been an important part of the preparation of the workshop. The understanding of environmental issues, viticulture, wine and climate change communication, is important in order for the presenter to be able to speak about all these complex topics and how they connect to each other.

2. Talk about the real world, not abstract ideas

It is very important to bring climate change to the reality of the everyday life and find its relation to things and notions that are easier to grasp, for a non-expert. When speaking in scientific terms people tend to be intimidated or just lost, because of lack of understanding. Even more, people are unable to relate to the ideas and problem of climate change. More and more scientists decide to give up on the “polar bear” argument, because it is something people cannot picture or understand its significance. Even if they do believe it, and get scared or sad about it, they will wake up the next morning and will go on living their lives all the same (Thompson, Jes - TEDxNMU).

In the case of this workshop, wine is the perfect product to talk through. First and foremost, wine is something we can buy, observe, smell, taste, enjoy in our everyday life. Even more, it is most probable that the people who would subscribe in such a workshop are already wine drinkers, if not wine lovers or even connoisseurs. They will learn how climate change impacts a product they actually buy, like and is part of their life, which makes it relevant.

The fact that wine is so sensitive in climatic changes, together with the fact that wine drinkers evaluate aromas, taste, structure and all the other wine characteristics, makes it the perfect tangible example, and through tasting they can find how all these characteristics can be altered because of climate change.

3. Connect with what matters to your audience

“Climate change can be related to anything from public health, agriculture, energy independence, the economy, beer hops production, wine, coffee, I mean, pick a thing, there is a climate impact connected. So figure out what your audience cares about and make the link for them.” (Thompson, Jes - TEDxNMU)

The goal of this specific workshop is not to communicate climate change, but to communicate climate change through wine. So wine will be the main aspect of the workshop and in order to communicate that, in a way that would eventually influence the wine consumers' behavior, regarding their buying choices, it is important to identify what is important to the consumers when proceeding to a wine purchase.

Starting from consumers' behavior -regarding all products, not only wine- there are 6 steps to be taken until the consumer arrives to the purchasing moment. One of them is the "purchase decision", which is influenced by many factors that have to do with the selling point environment and the wine itself, like for example the price, the quality or the origin, to name a few. (Riviezzo, De Nisco, & Garofano, 2011) All these factors of course are not equally important for every wine consumer's profile, and can be further evaluated in relation to each specific market segment.

However, among the many factors and criteria that influence wine consumer's purchase choice, the quality of the product is the one that becomes more and more important (Riviezzo, De Nisco, & Garofano, 2011). Just like bad quality wines can be found in any so called "good year", good quality wines can be found in "bad" years. Adding the price factor to that, wines from good years tend to have significantly higher prices, while the ones from "bad" years are significantly cheaper, and could be considered a bargain.

4. Tell a human story

A human story is more probable to not only put climate change facts into perspective and make them more understandable for the public, but to also create an emotional connection with the audience, which is important in order to inspire change. (Loh & Harris, Climate change: The importance of making it personal, 2018). We are after all at the age of showing emotion, event scientists are, and it is more important than facts. (Walsh, 2016)

Many environmental journalists and climate change communicators are using this technic in order to show how related our lives are with natural and climatic conditions. This can be achieved by sharing the experience of a person, a family, or a community, impacted by climate change. Sometimes the story could describe how the presenter themselves became aware of climate change, and what gave birth to the will to communicate it to others. Miguel Torres, during his speech in CCL-Porto 2019, shared his story of how the documentary "An inconvenient truth" led him to take action within his company.

“At Climate Reality Training, they teach us not to lecture people about why they are wrong. It seems obvious that they’ll hear your words to mean “You’re stupid” — clearly not a route to mutual understanding. Hard as it is to resist, better to tell them your own personal story: How climate change is affecting you as an individual, why you feel the need to act, what created your sense of urgency.” (Winkler, 2018).

Hopefully getting personal could create a better connection with the audience, and maybe even provoke them to share their own personal stories. This is another important rule when trying to communicate an idea, not only regarding climate change, but rather any subject: Know your audience. Promoting interaction and participation is key in order to have an insight into the audience’s mind, and decide how to speak to them. (McClintock, 2018)

However, in this specific workshop the main stories shared would be the ones of the producers whose wines would be tasted. It is the producers who are the protagonists and share how they have seen the impacts of climate change in their own vineyards, work and wines. In the next chapter, the process of finding the producers and interviewing them is being described in detail.

5. Lead with what you know

There is still a lot of uncertainty among scientists regarding climate change, enhancing people’s skepticism, doubt and denial. It is more effective to focus on the parts that are certain, in order to avoid confusion. A good idea is referring to the weather extremes that people can actually testify on themselves since they can see them happening. Speaking about climatic conditions that the producers have faced is not only real, but also confirmed by their own words.

More importantly, research on climate change can only provide us with models, assumptions and possibilities for the future. Just like Charles C. Mann says *“Climate change has no lab rats”* (Mann, 2014), which is why many research results and predictions seems too abstract, far away into the future or even non-realistic for the public. We can talk with certainty about the impact we already see around us right now, rather than trying to persuading people about the probable of catastrophes of the future. At the same time, the latter should also be communicated, to point out the severity of the situation, yet it should not lead the conversation. However, there are other environmental communicators who believe that uncertainties should be openly discussed with the audience. (Center for Research on Environmental Decisions, 2009)

Once again communicating climate change through wine seems to be very convenient, since we can talk about the practical issues that producers are already facing, and more importantly see the impact on wine's taste and characteristics from the one year to the other.

6. Use the more effective visual communication

There is no need for extra visuals since the wine is supposed to be the means of communication and also the focus of the workshop. Individual cards with information about each wine will also act as visual communication. However, the workshop should still remain partly fun and focused on wine tasting, and not turned into a presentation or a course, which could end up being too serious, heavy and have the opposite of the desired effect.

Other guidelines

The most important challenge that should be taken into consideration when communicating climate change is the fact that it is not a happy subject. It can generate negative feelings, despair, fear and stress. It could also leave people feeling powerless and helpless in front of something so big and serious. Scientists are constantly confirming that we are at the point of no return, or that we only have just so many years left to act and save our planet.

Many scientists have started talking of “pre-traumatic stress disorder”, according to the psychiatrist Lise van Susteren, a condition similar to post-traumatic stress disorder (known as PTSD), only that it takes place before the incident actually occurs, with the remedy being “taking action” (Hopkins, 2018). This disorder is influencing people’s minds, lives in such a degree that it even impacts their decisions of having or not having children, which is a proof that people with this disorder cannot imagine their future (Mandel, 2018). So we have to find the way to talk to people in a way that motivates them and does not push them to despair.

But how is it possible to communicate in a positive way, something as negative and severe, without risking making it sound less important than it actually is? On the other side is it possible to make people realize the severity of the situation, without scaring them so much that they paralyze and don’t act? The United Nations Development Program, recently discussed that fragile balance between “hope and despair”, revealing that they have been trying to adopt a two way strategy, which means sharing the bad news (that are actually representative of the bigger picture) and at the same time celebrating the good news, the small victories and the slow progresses, even if those are representative only in a local scale. In that way people are aware enough to realize how bad the situation is, but at the same time they see that there is progress and change, innovation and success, which gives them hope so that they act as well (Rosenthal & Scheuer, 2019).

Against leading with all the arguments about the catastrophic things that are bound to happen in the future, it would be more effective to lead with all the nice things that can be done, and are being done, to turn the situation around. It is important to make sure that the audience believes that there are solutions that can work and people have the power to make them work. Positive reinforcement, making wine consumers believe that they have the power to change the way wine is produced, will make them more eager to act. (Thompson, Jes - TEDxNMU).

4.3 Field research

4.3.1 Choosing the producers

Banca del Vino is a cooperative of more than 300 Italian Slow Wine producers, working with several labels from each one of those, for that reason it was important to decide on the criteria that would be used to filter the producers and decide which ones would finally be contacted. The objective was to have at least five responses, hence five wines to present in the end, for the purposes of the workshop, so that the structure and price would be in harmony with the rest of the workshops offered. In the end the criteria were the following three:

1. Small producers, less than 20 hectares: Since the very personal experience of the producers is wanted, it is important to talk with people that can have a good overview of their vineyards. Bigger producers tend to focus on some of the vineyards, generally those that produce their best labels, and tend to have several employees and possibly one or more viticulturalists leading the work. However in smaller holdings it is more probable that the producer can have a good overview of all the changes taking place in his different plots. There was only one exception, Elisabetta Foradori in Trentino, due to the importance of the producer as a figure in the sector, revolutionary and very climate-change aware, so that she was included.
2. Certified organic/biodynamic producers, or “in conversion to organic” producers: Even though it is not certain, it is more probable that producer who work with respect to the environment would be more aware about environmental issues, and more willing to respond and help.
3. Producers that use 100% grapes from their own vineyards: Once again it is important to speak with producers that are absolutely in charge of their properties and can give a good description of the changes that have been observing in the last years. A producer that is maybe buying 50% of the grapes he vinifies is not as an accurate source as one who owns and cultivates 100% of what he vinifies.

After using a database which displays all the information of all the producers that are members of Banca del vino, and filtering them according to the aforementioned criteria, there were 53 that fulfilled the requirements (Annex 1 & Annex 2), and they were all contacted via an email (Annex 3), explaining the purpose of the thesis, the idea of the workshop, and what would be expected from them.

In total, 15 producers responded, with 14 of them being very positive and one of them being thankful to be contacted, but lacking time to be interviewed. From those the 11 were eventually interviewed and 9 of those testimonials, the ones that were more interesting, complete and relevant to the topic, are included in this thesis.

During the interview, which was realized in Italian and through a phone call, the producers were encouraged to speak about their very personal experience, actions and point of view. That is why the testimonials can focus differently in each one of the subjects discussed, according to each producer's experience. They were however four general questions, which were used to guide and orient the conversation, that were posed to all of them. (Annex 4)

4.3.2 Problems and Limitations

The main problem faced when contacting the producers was the timing. Only one week before Vinitaly, the most important international wine fair of the country, the producers were extremely busy. Following the fair, were the Easter holidays, the Italian Liberation day and the 1st of May, which resulted in many producers asking to be contacted again later.

Some of the producers were more eager to welcome the interviewer for a visit and tasting (especially the ones in Piedmont), rather than being interviewed through a phone call. However the region is poorly connected with public transportation and it is impossible to reach the majority of them, so this was not a possibility in the end.

The wines would be selected according to the indications of the producers regarding the quality and the year, and of course according to their availability in Banca del vino. Unfortunately some of the wines were not available for use, or even not available at all, or were supposed to be ordered and arrive in the future. That limited the realization of the workshop, considering that there was not enough time for new orders to arrive, before the end of the internship.

4.3.3 Testimonials

Following are the testimonials of the producers, translated, summarized and organized in a homogenous format by the interviewer:

1. *Foradori, Trentino*

The person interviewed: Emilio Zierock, son of the winemaker Elisabetta Foradori

General changes & problems

The most evident change is the “tropicalization” of the climate, with yearly average temperatures being higher during the last three years, higher, longer and more intense precipitation. All these characteristics are especially seen during spring -bud bursting and flowering- a crucial time for the formation of the grapes, and during harvest. These conditions are also perfect for the development of fungus diseases, like Peronosporos, which is becoming more aggressive. For wineries that work conventionally this is not such a big challenge, since they can apply preventative spraying. However, Foradori is working biodynamically, in which case diseases are a problem.

Teroldego, an autochthonous grape in the Trentino area, used to mature between the beginning and the middle of October, but ever since 2013 the harvest is taking place always earlier, between the first and the third week of September. In the vineyards, the main change is decrease of green harvest and leafing.

Specific years

2015: The driest year, yet not extremely dry in order to cause problems. That year they started working they planted some new vines, changing to more resistant rootstock.

2017: The most representative year in terms of climate change, and which actually gave birth to a new wine label for that exact reason. During the days of the 8-9-10 of August there was a heavy hailstorm, an extreme phenomenon for that region and for that time of the year, which actually resulted in the loss of more than half of the production. They had to come up with an idea to take advantage of the grapes that were left, so they adjusted to the character of the grape and produced a light bodied, macerated, rose wine, called “Lezer” (lezer = light in the local dialect). A lighter and fresher rosé Teroldego, blend from different vineyards and different kinds of maceration (one part in stainless steel tanks, one in amphora and one in wood).

Personal views

Being situated so north, very close to the Italian Dolomitic Alps, the problems are not as severe as in the South part of Italy, for example Calabria, Puglia or even Sicily to name a few, where the grapes have significantly higher concentration in sugars, and are lacking the acidity of the past, but even more importantly vineyards are suffering extreme drought. In Trentino the problem is uncertainty. There is production, but producers don't know any more when to harvest, because of the confusing climatic conditions.

Emilio Zierock, feels like he lives in a "bubble" where everyone knows about climate change and the impact and the differences in the years, so there is no need for big communication effort since their market is already aware. That is because they are producing low intervention wines, in a biodynamic way, so their market already knows what to expect. Moreover, according to Emilio, it is easier to work with the millennial market for wines like these, since millennials appear to be already more aware of climate change than other generations, they are always asking for something new, and are more eager to accept differences. So wines are different from year to year, and there are improbabilities and extremes but millennials like that. Maybe the more difficult market that actually needs communication is the restauration, because there, there is higher demand for more standardized products. But it is in the hands of the sommelliers to communicate the wines and their story, and their differences.

Wine chosen: Teroldego "Lezer" 2017

2. *Paitin, Piedmont*

Person interviewed: Luca Pasquero-Elia, son of Giovanni Pasquero-Elia, one of the owners

General changes & problems

Regarding vineyard management, in the Grand Crus that are facing south, they are not doing green harvest and leafing that they were doing in more normal years, to protect the grapes from burning.

In very warm years, the variety Barbera is suffering, because it is very sensitive to high temperature and concentrates excessive amounts of sugars. As a result malolactic fermentation is impossible to occur, due to high alcohol. This is a problem for them, because their wines undergo spontaneous fermentation, but it is not a problem for those using commercial yeasts.

Another problem are the winters, which are not as cold as in the past, resulting in big populations of cutworms, since they do not die during winter, due to the lack of low temperatures. They reproduce and attack the vine buds in spring. Since they are organic producers and they do not use pesticides, they actually clean the vines of the cutworms by hand, at night, which is when they actually appear in the vineyard.

Specific years

The warmest years lately have been 2003, 2011, 2015 and 2017, but there are a lot of different details to be taken into consideration, which end up influencing the production differently.

2003: Extremely high temperatures both during the day and the night, which leads to wines expressing ripe and cooked fruit, and an earlier evolution.

2011 & 2015: both very warm and very similar, yet the production suffered more in 2015, whereas the wines from 2011 ended up being perfect.

2017: The driest year after the extremely dry years 1943 and 1947. The clay-limestone-sandy soils get very dry and break so deep, that the underwater evaporates. The solution, the same that their grandfather was also using at his time of extremes, is to already break the superficial part of the soil, in order to protect the deeper soil of being exposed, and the deeper water storage of evaporating. Even though the year seemed very similar to 2003, the nights were not as warm, and so the wine kept some acidity and freshness.

According to the producer, the most important and crucial time to observe is the last 45-50 days before harvest. For example, the year 2018 was declared a cold year, yet after middle August it was very warm, so the wine resembles to a wine from a warm year.

Personal views

The region of the Langhe is lucky to face warmer years, as far as it concerns the Nebbiolo variety. It has a very long maturation period, with no excessive increase of sugars in the grape, even during extremely warm years. The wines produced have more mature tannins and more concentrated flavors, and resemble to the wines of those years that in the past were classified as “great” or “excellent”. When looking back to history, those important years were always the warmer ones, that are not very typical in the generally colder region of Piedmont, hence they were appreciated by the producers, since they were giving rounder wines, more ready to drink.

There are two reasons why we should talk about climate change, according to Luca. Firstly, in order to inform and educate people. Secondly, so that people understand how wines evolve through the years.

Wine chosen: Barbera d'Alba Superiore "Campolive" 2015

3. Azienda Agricola Possa, Cinque Terre

Person Interviewed: Samuele - Heydi Bonanini, owner and winemaker.

General changes & problems

According to Heydi, the winters lately tend to be much warmer, resulting to decreased duration of winter rest, earlier spring onset, and in the end an exhausted plant. Moreover, springs are significantly unstable and unpredictable, with very high or very low temperatures. His grandmother is speaking of typical springs that were fresh and rainy, when the heat was arriving during June, lasting until August when the summer storms were starting. Now the plants are confused and don't know how to behave, but the producers are confused too, since all the knowledge and experience of the old past is not applicable and in the current circumstances.

Specific years

Ever since 2008 he has never made the wines that he was making in the past, with acidity and freshness which is typical in Cinque terre. In order to make wines closer to those of the past years now they have to harvest one month in advance, to maintain the acidity. However this results in unbalance and lack of body, which they compensate with longer maceration.

2017: The harvest started 15th of August, almost a month earlier than typical, due to the high temperatures.

2018: In October 2018 there was a big storm in Porto Fino, which was very atypical not only for the time of the year, but also for the place, since it cause such high waves that never occur in the Mediterranean sea of Liguria. At the same time, a catastrophic whirl hit the "Foresta dei Violini" in the Trentino, with catastrophic results. Both incidents took place simultaneously, and were described an abnormal by the Italian Ministry for the Environment. The vineyards in Liguria are planted in terraces in steep slopes, and extend from high up the slope until the sea level. The result of the catastrophic storm of 2018 was for Heydi to lose a whole vine row, the one

closer to the sea. This for him is another example of extreme phenomenon, linked to climate change, one that causes great economical damage, too.

After this bad weather incident, the vineyards lost all their leaves until the 30th of October, preparing for the winter rest. As from 31st however, the weather was so warm, that only in a few days the plants started growing leaves again. This is the problem of a prolonged summer, which confuses the plants and interferes with their winter rest preparations.

Personal views

Heydi is also a bee keeper so he can see the decrease of his bee population first hand, another impact of climate change. According to him, the climate is changing but also the world is changing a lot. Unfortunately people are disconnected from nature and agriculture, and very much connected to technology, and this is part of the problem.

Wine chosen: “Cinque terre” Bianco 2017

4. *Villa Venti, Emilia-Romagna*

Person Interviewed: Mauro Giardini one of the two owners and winemaker

It is important to say that Mauro is not an old producer, and he does not come from a wine producing family. In 2002 he decided to change his life, leave the city and start producing wine. He bought a plot that was abandoned for more than 16 years, partly covered by forest in order to make good clean start without need for purification or conversion to more environmentally friendly practices. He decided to keep the forest untouched, in order to profit from its biodiversity, and achieve a healthier ecosystem in his vineyards. He also planted grains, orchard trees a vegetable garden, for the same reason.

General changes & problems

With a wine production starting in 2002, he admits that he has not experienced the changes of the climate, the way that older producers have, so his knowledge come from his discussion with other producers, regarding the situation during the past, and the comparison with the present.

He argues that, today, winemakers have to be in the vineyards every day, observing, trying to understand what is happening. In the past it was possible to predict the evolution of the year already since spring, something that nowadays is impossible to do. It is confusing for the plant

and the producers too, it is difficult to make decisions in the vineyard. The main discussion nowadays among producers is “What did you do in your vineyard this spring?”.

Another big problem, for all the producers, and especially those working without using any chemical treatments, is the rot after intense rain.

Specific years

2014: The heavy rainfalls of 2014 lead to not to vinify 40% of the whole production, due to rot and other problems caused by the rain and humidity. However he argues that he produced a wonderful Sangiovese that year, that was not wonderful right away at the time but it is now. What he changed in the vinification process, comparing to other years, is that he did carbonic maceration in the beginning, and long maceration during and after fermentation for 50% wine.

2017: An extremely warm year, where the international varieties did not manage to achieve good maturation but the autochthonous matured well enough. Wines from that year are very intense, with high minerality and dry tannins that perfectly describe the terroir and the vintage.

Personal views

This producer chose biodynamic practices from the beginning of his wine production, because he believes in the properties that these practices give to the vine, starting from the fact that they make them more competitive and grow deeper root systems.

He also makes a reference to Vinitaly 2019, where four seminars took place concerning climate change and the winemaker's response to it. This is not a coincidence but a proof of how important it is for the producers to focus on this issue and find solutions to adapt. Like he says *“The vines are always stuck there, in the same place. It's the winemaker that has to change his behavior”*.

He also believes greatly in the important of autochthonous varieties, and their high level of adaptability and resistance in changes occurring within their own territory, where they have been living and evolving for many years. Regarding difficult years, he argues that it is indeed those years that show the capacity of the winemaker to survive.

Through his communication with consumers and also wine tourists visiting his agro-tourism facilities, he understands that there is always more interest, and more awareness among consumers. So it is becoming easier to speak to them about environmental issues, and

producers should indeed speak about these issues. He believes that everyone can make a change through their own work.

Wine chosen: “A” 2017

5. *Sorelle Bronca, Veneto*

Person Interviewed: Elisa - oenologist, daughter of Ersiliana, the one of the two Bronca sisters.

General changes & problems

Climate change has been obvious for at least 10 years now in the vineyard, with the first and most obvious impact being the harvest dates. In the past it was taking place after middle September, while today it starts already by the end of August. Summers tend to be extremely warm or extremely rainy, there is no middle way.

Regarding the cellar work, in the very warm years they use dry ice to keep the grapes cold, to avoid the fermentation starting before arriving at the cellar, and to achieve more organoleptic characteristics in white wines and also in the press. They also use cold temperature static decanting method, to separate the juice from the must and avoid contamination of unwanted microorganisms like bacteria, or once again spontaneous fermentation. The cold temperatures in general, before and during fermentation contribute to the aromatic and fresh character of their wines, very important for Prosecco.

For the red wines, when the year is not very favorable, they do not produce Riserva labels and they sell some part of the grapes.

Specific years

2003 & 2013: Two extremely warm years, but 2013 gave fantastic red wines.

2014: A very rainy year, that led them to decide to not produce any red wine because there was no reason to. They keep a good stock of earlier years so that they have the possibility to survive in years like this, without compromising the quality of their product and their market. However the Sparkling wines are not only easy to adjust, but actually thrive in cold years because of the well-kept acidity.

2019: Already a very complicated year, with the winter being very dry, followed by a lot of rain during the whole month of April, just after the plants had woken up and were ready to flourish.

Personal views

Climate change communication depends on the people we have in front of us every time. There are aware people, but there are also those who are used to drinking an easy wine, like a Prosecco, so they don't care about learning more. Foreign distributors seem to always be more interested and informed, and always coming more prepared and asking more things regarding environmental issues and climate change. The Italian market does not seem to consider this issue as much yet.

Wine chosen: Valdobbiadene Prosecco Superiore "Particella 68" Brut, 2018

6. Corte, Piedmont

Person Interviewed: Sandro Barosi, owner and winemaker

The first topic on which he wanted to focus on was the fact that they are certified organic, not only because they believe in it and in respecting the environment, but also because they live near the vineyards, so they didn't want to intoxicate the air they breathe. He has been a member of Slow Food for more than 7 years now, and in 1997 and 1998 he traveled around America with Carlo Petrini, speaking about organic practices, so for him this mentality is not something new.

Specific years

Barosi decided to focus on the following representative years, because the grapes of the years 2002 and 2014, were the complete opposite of the grapes of 2003.

2002: It was a very rainy year in the Langhe region, so the producer decided to produce wines from the grape Dolcetto, only under the appellation "Dogliani" which are wines fresh and meant to be drunk young, and not "Dogliani Superiore", which are more complex and structured wines.

2014: A year just like 2002, where they produced the same labels of Dolcetto, but also some Barbera and Nebbiolo wines. The wines of this year are very fresh, easy to drink, nice and tasty but they need some time to express themselves. That was also a year where they had to do a lot of treatments of Verdigris and sulfur.

2003: Extremely warm, so much that the grapes had the quality, structure and potent to produce wines under the appellation “Dogliani Superiore”.

Personal views

In difficult years we have to give time to the wines to evolve and mature, in order to really see good results. He argues that consumers should understand that the wine, from small-scale organic producers, cannot be standardized like biscuits and Coca-Cola, it has dramatic changes from year to year. However, consumers who tend to drink natural wine, or organic wine, or low intervention wine, or however they call it, are significantly more aware and ready to listen and talk about things regarding environmental issues and climate change.

Regarding climate change he is always trying to talk about it, and it seems that people always want to learn more, but that it is not in the best interest of all the producers to talk about these things, especially some bigger-scale, or more industrial producers tend to avoid talking about these things, they don't want consumers to think about it, search and be aware.

Wine chosen: Dogliani Superiore 2003

7. *Terre a Mano, Tuscany*

Person Interviewed: Rossella Bencini, winemaker

General changes & problems

According to Rossella changes existed also in the past, there always have been more regular years and more difficult ones. However the last years the climate is more extreme, and one of the most obvious changes is the fact that it does not rain a lot any more.

She finds that biodynamic practices in the vineyard have been very helpful in preventing a big part of the problems. The biodynamic working techniques give a security in difficult years. For example she has seen great results after starting using the 501 preparation (made of quartz crystals, called the preparation of light and heat, since it enhances these two elements in the plant). For example in the year 2010 and 2014 that were both very rainy and cold, 501 has helped a lot because it enhances the maturity and the aromatic potential, so those two harvests were solved because of this preparation. In the past that they were not using it they couldn't achieve good maturation.

Other changes or practices are, just like everyone else does, to remove more leaves and favor aeration in the plant. Also a more intense green harvest (crop thinning) during cold years.

In the winery they are living the wines longer time on the lees, with more frequent battonage in order to gain structure and body.

In very warm years they use no fertilizers or nutrients, so that the soil reaches deeper for true minerals and water. "Don't force the plants". Forced plants (fertilized) that produce more in warm years, suffer more at the same time. They remove only the leaves in the interior but leave the exterior for protection.

Specific years

2002: A very difficult year, that they had to throw a lot of grapes, but in the end the wine made with the good quality grapes that remained was very good.

2014: This very rainy year, she decided to risk and wait and not harvest early. By October there was still some grapes left, and the aromas were very elegant. After the rain, came some days of sunlight.

2017: Exactly the opposite in that very warm year. They decided to risk once again and wait until the fruit was perfectly ready. She wanted to believe that after 5 months of extreme cold, some rain will arrive, and it did. By the time they were starting to harvest, everyone else had already harvested everything. In the phenolic analysis everything was ready, however in taste the grape was not ready yet (in tannins and aromas that were not mature). So once again they waited, and in the right moment the result was perfect.

Personal views

Rossella believes that winemaking is all about taking risks, and that wine is the only agricultural product that is influenced so much by so many factors, from the grape to the wood that is used, if it is used, to the fermentation duration, to the malolactic fermentation if it occurs or not. So it is normal that the wine changes every year, and it is the winery that should stay the same and always work with the same quality. Thankfully, people are tired of wines being all the same, so a lot of them have changed mentality, and even more of them will change in the future, because it's more fun to discover different things.

Wine chosen: "Carmignano" 2014

8. *Da Capo, Piedmont*

Person interviewed: Renata Bonacina, winemaker

General changes & problems

The biggest changes have been seen mainly in the wines that are meant for long aging, since a lighter body makes a wine less capable of long aging. However wines of this kind are more balanced and ready to drink. The big jumps in temperature, together with the fact they are in conversion to organic viticulture, demand for greater attention to the vineyard's behavior, and especially in diseases like gray rot, oidium or mildew after a lot of rain. This leads to the need for more copper treatments, something they try to avoid, due to the fact that it ends up in the wine.

Specific years

Renata decides to speak about the following three years because they were extremely different the one from the other, with many difficulties and problems, however they gave very positive expressions, especially the 2016 and 2017.

2016: Due to very high sugars, the fermentation process was very complicated and they had to control the temperature very carefully.

2017: Ruche, an autochthonous variety of the region around Asti, is receiving more and more attention by both producers and consumers. It is a variety that is not often produced to age, hence it is appreciated for its fresh and light character. In 2017 the Ruche wine was a completely different expression from what a Ruche is expected to be, with an alcoholic title slightly higher than 14.5%vol, due to very high temperatures. The wine is interesting, more powerful and could actually undertake short aging, but it is not "typical" for a Ruche.

2018: In contrary to 2017, 2018 gave a Ruche with 13.5% vol, refined and elegant with a lighter body. Two wines completely different, both interesting, form two consecutive years. For the part of the production that is meant to age long, like Nizza DOCG, they actually decided to declassify the wines, since the long aging required by the appellation would actually spoil the wine's character.

Personal views

Just like many other producers have pointed out, Renata talks about the fact that it is anyway impossible for small producers to produce wines that are standardized year by year. But for

them it is not a problem, because their market likes this kind of wines, and this kind of winemakers, and is actually intrigued by the differences in the wines, rather than discouraged or appalled.

Wine chosen: “Ruche” 2018

9. *Fattorie Romeo del Castello, Sicily*

Person interviewed: Chiara Vigo winemaker daughter of Rosanna Romeo the owner

General changes & problems

One of the main problems face is the water shortage. Even though this winery is in Etna, which means that the climatic conditions are more similar to the North of Italy rather than the rest of Sicily, where drought is even more intense, they are still facing water problems. Not only due to less precipitation during the year, but also due to less snow in the mountain, there is shortage in underground waters. The DOC Etna, that just like many other prestigious appellations does not allow irrigation in the vineyard, will have to take this into consideration and adjust the relevant regulations, especially for grapes like Barbatella which is suffering.

Another problem for them is definitely the temperatures that lead to early harvesting and unbalanced maturation.

Specific years

Chiara decided to speak mainly about the Rose wine VigoRosa because of the great variation it has shown during the last two years, that have been extremely affected by climate change and she considers more representative.

2017: A very warm year, with more than four consecutive months of no rain, and abnormally high temperatures, above 40°C in 700m altitude. The harvest took place in the end of September instead of the middle of October which is the average date. The must had a potential alcoholic title of 14%vol, which is exaggerated for a rose wine. The grapes were taken directly to the press where they spent three hours. However, as the grapes hopefully kept some acidity the wine produced was interested and appreciated, even included within the most interesting wines from Etna according to the Wine Spectator, “but definitely strange”, as Chiara calls it.

2018: It is not normal in Sicily to rain so much especially during the summer. From August until September it was raining every single afternoon. Almost no producer in Etna achieved the alcoholic title required by the appellation, so, even Chiara gave up on the top quality denominations, but it was a perfect year to produce a good rose. This year they macerated for twelve hours before pressing.

Personal views

Chiara argues that the most abnormal years are the most interesting in the end, because the producers are being much more attentive. Even more, if a very thorough selection is made during the harvest, then only the best grapes arrive in the cellar and in the end the wine produced is of high quality.

Small producers, as well as importers and distributors of small producers' wines, always promote wines with a great focus on the year and the territory, so for them, diversity in years is actually an added value to the product. According to Chiara, every time that they themselves do a tasting they always try to recount even more those years affected by climate change, and while explaining, people seem to be even more interested in understanding more, while they are also fascinated by those differences they find in wine.

Wine chosen: "VigoRosa" 2017 or 2018

5. Design of the workshop

5.1 Branding

The title of the workshop is “Great wines from hard years”. The goal was that the title would communicate a positive aspect, to balance the negative one, and would also be intriguing. The words “climate change” were decided to not be included in the title, but rather to be displayed in another position of the poster (Annex 5), with smaller letters and of course in the description of the workshop (Annex 6) that would be uploaded in the website and in a Facebook post. Even if the workshop was going to be about climate change and wine, it was not a good idea to include that directly into the title since it could turn people away by sounding too negative, serious or even irrelevant to some.

When creating the poster for the event the idea was first of all to make it stand out of the rest of the workshops that Banca del Vino offers, since it has indeed a very different and specific focus. Furthermore, another objective was to make it look attractive and “cool” so that people would be intrigued into further looking into it. A photo depicting powerful weather phenomenon is not only captivating people’s attention and creating powerful emotions to them, but it is also very relevant to the topic, so it was considered to be a suitable choice. No wine related themes were chosen, to make it stand out, to not fall into banalities and to also give a hint that this workshop is going to be different than the rest. Also the fact that 5 wines would be tasted should be clearly communicated, since it is actually the most appealing and entertaining part, and also the one that justifies the price of the participation.

5.2 Supporting Material

Informative individual cards were created for each wine, divided in three parts: information about the wine tasted, the year, and the producer with some of his personal words (Annex 6). Each participant would have his own cards for each of the wines tasted, accompanying them during the tasting. The one side of the card is the actual Banca del vino postcard, where a map of Italy is displayed. On the map, the region where each wine comes from would be indicated.

5.3 Communications

The workshop would be added in the “Workshops and Tastings” section of the website of Banca del Vino, and would also be communicated on Facebook by posting the poster and a small description, as a brand new activity. A newsletter would also be sent out including the poster, the description and the practical information as well.

5.4 Structure of the workshop

Just like in all the other workshops offered in Banca del vino, the participants would be welcomed and taken for a tour in the historical cellars, where they would receive a brief explanation of the history and function of the place, as well as an idea of the diversity of the Italian wine world. Then they would be passed to the tasting room where the tables would be already set with 5 glasses, water, breadsticks, and of course the 5 individual wine cards, with information on each wine.

They would first be given a piece of paper and be asked to write down a thought regarding the relationship between climate change and wine; if they believed there is any. After that the presenter would start with a narration of their personal experience regarding climate change and participation to a discussion would be encouraged, followed by a brief and basic introduction on climate change and its impact on wine. Soon enough the tasting would start. For each wine the participants would turn their cards around and would be able to read all the basic information about the wine tasted, accompanied by some more detailed information by the presenter, always stemming from the producer's testimonials. In the end of the tasting the participants would be given another paper, and would be asked to write down their "take-away thoughts", what they learned, what made an impression to them, what they will remember after this tasting.

The questions answered before and after the workshop would be used to evaluate how effective the workshop is in communicating climate change, and what messages are actually being communicated to the public, according to their former knowledge and the information acquired after participating in this event.

6. Realization of the Workshop

Finally, the workshop took place on Thursday 13th of May, with an audience of 11 people. However this was a test-workshop, mainly to serve the purposes of this thesis, with a symbolic price covering only the expenses of the wine bottles that were opened. The participants were considered a biased group, since the majority of them were students from the University of Gastronomic Sciences, and aware (some of them more and some less) of climate change issues, connected to agriculture and food production.

Word to mouth communication was used in order to find participants, and it was mostly communicated to a very small social circle. Only four wines were used instead of five, due to the limited availability of the wines needed at the time, and the time limitation to actually order the wines missing. The official structure of the workshop was followed from the beginning to the end, and the participants received the complete experience. They were asked the questions before and after the workshop and their responses can be found in the Annex 8.

Due to the fact that the internship was soon coming to an end, and at the same time not all the wines needed were yet available, it was mutually decided not to upload the workshop on the website and social media, and to not send out a relevant newsletter. Even if it was decided that the workshop would be officially communicated, the offer would not be able to stay open after the internship was over, at least for the time being, since the rest of the staff of Banca del vino would have to study all the information collected and make the proper preparations to be able to guide the workshop. However, the design of the workshop, the material and the information are available for Banca del Vino to be used at any time in the future, and offer a new, interesting and educative workshop, with a completely different topic.

Photos of the workshop can be found in the Annex 9.

7. Conclusion

Climate change is a current problem that should be more communicated and discussed. Since it has an impact in every aspect of people's lives and in every part of the world, there are numerous possibilities to achieve its communication, all that is left is to choose the right one, for the right audience.

The wine sector is highly impacted by climate change, with the global wine community agreeing on that and taking action. Communication to wine consumers is key to achieving a more aware, resilient and accepting market, especially since the wines of the future will be characterized by more diversity from year to year, without that necessarily having an impact on the quality. More importantly, showing to consumers that they have the power to change the way wine is produced, through more environmentally responsible purchases, will make them more eager to actually take action.

Wine tourism could be a perfect sector where to start talking about the environmental issues faced by the wine sector, if we consider that wine tourists, even if not all of them, are people who tend to appreciate wine, like wine and buy wine. They search for wine experiences to learn more, so they are a good audience to communicate one of the most important challenges the sector is currently facing, a challenge that they can actually find inside their glasses.

There is no doubt that further research should be conducted in order to actually see and measure the results that such communication could have in the wine tourist's mind, mentality, choices and actions, as well as to create guidelines and strategies on how to properly communicate climate change through wine tourism, or wine in general. Hopefully, with the global wine community declaring that proper communication is part of their actions to be taken, there will be such research in the future.

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Annexes

Annex 1 – Producers information list

Region	Producer	Year	Hectares	Bottles/Year
Alto Adige	Haderburg	1997	11,5	95000
	Roberto Zeni	1882	13	130000
Trentino	Foradori	1930	24	160000
Friuli Venezia Giulia	Borgo San Daniele	1990	18	56000
	Vignai da Duline	1997	8	22000
	Edi Keber	1980	12	60000
Liguria	Bio Vio	1990	8	56000
	Agienda Agricola Possa	2004	3	14000
Toscana	Podere Il Palazzino	1972	15	60000
	I Luoghi	2000	3,5	14000
	Altura	1999	3	7000
	Corzano e Paterno	2004	18	75000
	Boscarelli	1962	20	110000
	Salustri		22	120000
	Terre a mano	1920	8	20000
	Campi Nuovi		8,5	40000
Veneto	Ca' Orologio	1995	12	25000
	Corte Sant'Alda	1986	19	80000
	Sorelle Bronca	1900	20	250000
Lombardia	Pratum Coller	2007	20	100000
Emilia Romagna	Villa Papiano			
	Villa Venti	2002	7	27000
Marche	Bisci	1980	19	120000
Lazio	Colli Picchioni	1976	12	90000
	L'Olivella		12	58000
Sicilia	Fattorie Romeo del Castello	1780	12,5	22000
Piemonte	Bruno Rocca	1978	15	70000
	Eugenio Bocchino	1997	5,5	25000
	Brandini	2006	9,5	70000
	Giacomo Brezza	1885	15	90000
	Iuli	1998	17	50000
	Cascian Ca' Rossa	1967	13	80000
	Cascina Corte	2005	5	26500
	Cascina Val del Prete	1977	11	55000
	Quinto Chionetti	1912	16	86000

	Dacapo	1997	7,5	45000
	Attilio Ghisolfi	1988	6,5	50000
	E. Pira & Figli	late 1800	8,5	35000
	Josetta Saffirio	2000	5	22000
	San Fereolo	1992	13	35000
	Simone Scaletta	2000	4,5	22000
	Cantine Valpane	1902	10	70000
	Diego Conterno		7	45000
	Mongioia		10	58000
	Ottosoldi	2000	5	25000
	Bruna Grimaldi	1957	14	66000
	Saccoletto Daniele	1970	11	20000
	La Zerba (Volpi)	2016	12	32000
	Brovia		16,5	
	Paitin		19	
	Busso			

Annex 2 – Contact information list

Haderburg	info@haderburg.it		Yes	No		
Roberto Zeni	info@zeni.tn.it		Yes	No		
Foradori	info@elisabettaforadori.com	331 43 31 664	Yes	Yes	Tel. 17/04 17:00	Yes
Borgo San Daniele	info@borgosandaniele.it		Yes	No		
Vignai da Duline	info@vignaidaduline.com		Yes	No		
Edi Keber	edi.keber@virgilio.it		Yes	No		
Bio Vio	info@biovio.it		Yes	No		
Agienda Agricola Possa	info@possa.it	348 31 62 470	Yes	Yes	Tel. 29/04 morning	Yes
Podere Il Palazzino	palazzino@podereilpalazzino.it		Yes	No		
I Luoghi	info@iluoghi.it		Yes	No		
Altura	altura@arcobalena.net		Yes	Yes	Recontact after 14/05	No
Corzano e Paterno	office@corzanoepaterno.it		Yes	No		
Boscarelli	cantina@poderiboscarelli.com		Yes	No		
Salustri	info@salustri.it		Yes	No		
Terre a mano	terreamano@gmail.com	338 87 39 577	Yes	Yes	Tel. 29/04 afternoon	Yes
Campi Nuovi	info@campinuovi.com		Yes	No		
Ca' Orologio	caorologio@caorologio.com		Yes	No		
Corte Sant'Alda	info@cortesantalda.it		Yes	No		
Sorelle Bronca	info@sorellebronca.com	329 21 45 523	Yes	Yes	Tel. 08/05	Yes
Pratum Coller	info@pratumcoller.it		Yes	No		
Villa Papiano	info@villapapiano.it		Yes	Yes	Recontact after 15/04	No
Villa Venti	info@villaventi.it	333 46 45 911	Yes	Yes	Tel. 30/04 morning	Yes
Bisci	info@bisci.it		Yes	No		
Colli Picchioni	info@collepicchioni.it		Yes	No		
L'Olivella	info@olivella.it		Yes	No		
Fattorie Romeo del Castello	info@romeodelcastello.it	333 24 98 903	Yes	Yes	Tel. 03/06	Yes
Bruno Rocca	info@brunorocca.it		Yes	No		
Eugenio Bocchino	info@eugenibocchino.it		Yes	No		
Brandini	brandini@agricolabrandini.it		Yes	No		
Giacomo Brezza	brezza@brezza.it		Yes	No		
Iuli	info@iuli.it		Yes	No		
Cascian Ca' Rossa	info@cascinacarossa.com		Yes	No		
Cascina Corte	info@cascinacorte.it	335 599 4166	Yes	Yes	Tel. 6-7/05	Yes
Cascina Val del Prete	valdelprete@tiscalinet.it	366 15 60 697	Yes	Yes	Visit (transportation?)	No
Quinto Chionetti	chionettiquinto@chionettiquinto.com		Yes	No		
Dacapo	renata.bonacina@dacapo.it	0141 96 49 21	Yes	Yes	Tel. 02/06	Yes
Attilio Ghisolfi	ghisolfi@ghisolfi.com		Yes	No		
E. Pira & Figli	info@pira-chiaraboschis.com		Yes	Yes	Gave all info in email	Yes
Josetta Saffirio	info@josettasaffirio.com		Yes	Yes	Very busy right now	No
San Fereolo	info@sanfereolo.com		Yes	No		
Simone Scaletta	viniscaletta@alice.it		Yes	No		
Cantine Valpane	info@cantinevalpane.com		Yes	No		
Diego Conterno	info@diegoconterno.it		Yes	No		
Mongioia	info@mongioia.com		Yes	No		
Ottosoldi	info@ottosoldi.it		Yes	No		
Bruna Grimaldi	vinigrimaldi@bruna.it		Yes	No		
Saccolotto Daniele	saccolottovini@virgilio.it	338 10 22 015	Yes	Yes	Tel. after dinner time	Yes
La Zerba (Volpi)	volpi@cantinevolpi.it		Yes	No		
Brovia	info@brovia.net		Yes	No		
Paitin	info@paitin.it	327 78 38 105	Yes	Yes	Tel. 10/04 11:30	Yes
Busso	bussopiero@bussopiero.com		Yes	No		

Annex 3 – Email sent to the producers

Orinigal (Italian)

Buongiorno,

Mi chiamo Eirini e sono una studentessa di un [Master Internazionale sul Vino e Turismo](#). Per il momento sto facendo il mio tirocinio alla Banca del Vino, e devo anche scrivere la mia tesi.

Per questo motivo vorrei organizzare un nuovo laboratorio-degustazione alla banca del vino, dove posso informare i visitatori sul cambiamento climatico e il suo impatto al settore vitivinicolo, parlando di come i produttori si adattano in questa nuova realtà. Tutto questo, vorrei farlo attraverso la degustazione dei vini delle annate dove gli impatti del cambiamento climatico erano veramente più sentiti. Il mio obiettivo è di fare le persone capire che, come le annate sono differenti, anche il vino è differente, però una annata "difficile" non significa un vino meno importante, interessante e piacevole.

Però per questo ho bisogno della vostra opinione, e il vostro consiglio. Sarebbe molto importante per me, se avete il tempo di parlarmi di un vostro vino di un'annata che era, secondo voi, difficile grazie ai imprevisti del cambiamento climatico, come avete superato le difficoltà, e che decisioni avete fatto, differenti delle altre annate più "normale".

Se avete il tempo e l'interesse di aiutarmi, lo apprezzerei tantissimo. Possiamo organizzare una telefonata, secondo il vostro programma e disponibilità.

In attesa di una vostra risposta.

Vi ringrazio,

Translated (English)

Goodmorning,

My name is Eirini and I am studying an International Master's course on Wine and Tourism. I am currently finishing my internship in La Banca del Vino, while I should also be writing my thesis.

For that reason I would like to organize a new Workshop-Tasting in Banca del Vino, through which I could inform visitors on the issue of climate change and its impact on the wine sector, by speaking of how the producers are adjusting in this new reality. I would like to do this through a tasting of wines produced in years that climate change impacts were significantly more experienced. My goal is to make people realize that wines are different, just like the years are different, but that a "difficult" year doesn't necessarily mean a wine less important, interesting and pleasant.

In order to make that happen, I would need your opinion and advice. It would be very important for me to know of one of your wines that according to you was produced in a difficult year described by unpredictable climatic conditions, due to climate change, how did you overcome those difficulties, what decisions you had to make that were different from other years, considered more "normal".

I would appreciate it very much, had you the time and the interest of helping me. We could organize a phone call, according to your schedule and availability.

Looking forward to your response.

Thank you,

Annex 4 – Questions asked to the producers

Have you been experiencing the impacts of climate change in your work, and which are the main impacts you have been facing?

Could you give some examples of some years and wines that were more representative, due to climate change?

What changes have you made in order to overcome problems caused by climate change?

Do you think that consumers are interested in this topic? Have you been trying to communicate it?

Annex 5 – Poster of the Workshop



Annex 6 – Description of the Workshop

Discover **5 wines**, from **5 different producers** from different parts of Italy!

Learn how **climate change** affects wine, how the producers are resisting, and how **great wines** can be produced even under the most adverse of conditions, all through a beautiful **wine tasting**, while learning the **winemakers' stories**, too!

Cost per person: 30€

By Reservation Only!

Send an email to info@bancadelvino.it or call +39 0172 458418

Annex 7 – Individual Wine Cards

The Wine

CINQUE TERRE BIANCO 2017
AZIENDA AGRICOLA POSSA

CINQUE TERRE DOC, LIGURIA

Varieties: Bosco 80%, Albarola 20%

Alcohol: 13,5%

4-5 days of maceration

Aged 50% in stainless steel tanks, 50% in big oak barrels

The Vintage

2017 A VERY WARM YEAR

HARVEST BEGINS ONE MONTH EARLIER

Due to higher temperatures, grapes are maturing earlier than in the past, so the producer decided to harvest earlier in order to keep the grapes' acidity. In order to compensate in body and structure, he started doing maceration for a few days.

The producer

BONANINI SAMUELE HEYDI

"SINCE 2008 WE CANNOT PRODUCE ANYMORE THE CINQUE TERRE WINES OF THE PAST"

In October 2018, big waves caused by a heavy storm destroyed one of Heydi's vine rows. The Italian Ministry for the Environment confirmed the extremity and abnormality of the phenomenon, for this region and this time of the year. Also a bee keeper and honey producer, Heydi observes the impact of climate change in the population of his bees.



The Wine

**BARBERA D'ALBA SUPERIORE "CAMPOLIVE" 2015
AZIENDA AGRICOLA PAITIN**

BARBERA D'ALBA, PIEMONTE

Varieties: Barbera 100%

Alcohol: 14%

20 days of fermentation-maceration with "remontage"

18 months aging in big old barrels of Slavonian oak



The Vintage

2015 A VERY WARM YEAR

BARBERA GRAPES SUFFER MORE THAN NEBBIOLO

The concentration of sugars is extremely high which can lead not only to a very heavy wine (untypical for a Barbera), but also to stuck fermentation, especially for the producers who do not use selective yeasts.



The producer

LUCA PASQUERO ELIA

**"THE MOST IMPORTANT AND CRUCIAL TIME TO OBSERVE IS
THE LAST 45-50 DAYS BEFORE HARVEST"**

However winters can be problematic, too. In recent years, due to the lack of cold temperatures, the cutworms do not die in the winter, resulting to big populations who attack the vine buds in spring. The only solution for organic producers, is to manually remove them during night, which is when they actually appear.



The Wine

**"CARMIGNANO" 2014
FATTORIA DI BACCHERETO "TERRE A MANO"**

CARMIGNANO DOCG, TUSCANY

Varieties: Sangiovese 75%, Canaiolo Nero 10%, Cabernet Sauvignon 15%

Alcohol: 12,5%

Spontaneous fermentation in vitrified concrete

18 months in "tonneau"



The Vintage

2014 A VERY RAINY YEAR

RISK IN WINEMAKING IS PART OF THE JOB

This very rainy year, she decided to wait, unlike most winemakers, and not harvest early. After the heavy rains came the sun, which helped the vines mature. By October the grapes were perfectly matured, and the aromas were very elegant.



The producer

ROSSELLA BENCINI TESI

**"IT'S THE WINERY THAT SHOULD ALWAYS STAY THE SAME
AND WORK WITH QUALITY, THE WINE CHANGES EVERY YEAR"**

Wine is the only product influenced so much by so many factors, from the grape to the wood (if used), to the fermentation, to the malolactic (fermentation) or not. People are tired of wines being all the same, so a lot of them have changed mentality, and even more will change in the future, because it's more fun to discover different things.



The Wine

**"A" 2017
VILLA VENTI**

RUBICONE ROSSO I.G.T., EMILIA-ROMAGNA

Varieties: Centesimino 100%

Growing method: Alberello

Alcohol: 12,5%

Spontaneous fermentation & aging in Amphora



The Vintage

2017 A VERY WARM YEAR

A TEST FOR INTERNATIONAL VS AUTOCHTHONOUS VARIETIES

The former didn't reach maturation, though the latter are very resistant and matured just fine. Wines from that year are intense, with a high minerality and drier tannins that perfectly describes not only their "terroir", but also the vintage.



The producer

MAURO GIARDINI

**"HOPEFULLY EVERYONE WILL HELP TO MAKE A CHANGE, ME
WITH MY WINES AND YOU WITH THIS WORK YOU'RE DOING"**

The vines are always stuck there, in the same place. It is the winemaker that has to change his behavior, according to each year's conditions. Above all, his goal is to respect nature and work well, to leave to his kids an alive and interesting soil, in a better condition than in the moment that he found it.

Annex 8 – Participants’ Answers

Question 1: What do you think about the relationship between climate change and wine? (If you believe there is any.)

Question 2: What are you “take-away” thoughts? Write what you learned and will remember after this workshop.

Q.1 “I think that climate change is affecting wine in the way that different varieties are relocated to areas where they weren’t always grown/produced, which I would assume affect the terroir and cultural traditions surrounding wine. Also wine is affecting climate change in the sense that wine makers are affecting the soil, soil degradation, when they don’t adhere to the natural cycles of agriculture/ growing.”

Q.2 “I think I am going to keep in mind that the year doesn’t necessarily determine the quality of the wine, rather it is the skill of the winemaker to adapt to the difficulties associated with the wine, and have an intimate knowledge of how to work with the wine.”

Q.1 “Lesser variety, lesser interesting wines. Temperature is affecting production cycle, areas and taste”

Q.2 “Let wine be what it is and not what you think it should be”

Q.1 “Harvest issues! Planting picking timing, labor issues hiring season. Vintage issues – vines struggling in changing climates”

2 “Risks in wine-making always. Open your mind to wine. Difficult years are not disasters.”

Q.1 “Rising temperatures affect the vineyards and grape growing, will this make wine sweeter? Because the grapes will ripen faster? Climate change will impact the identities of the wine regions and communities. This will include the identities of dying wine regions but also the changing identities of new wine regions which are appearing due to changing temperatures.”

Q.2 “Support organic and biodynamic wine by buying them. Have a more open mind.”

Q.1 “Climate change could transform wine production. As climate changes , precipitation patterns change, seasons change, which means the soil and plants and organisms in the entire system could be impacted. The harvest time and yield could be impacted along with the flavor of the grapes. Climate change presents enormous challenges but could it also bring a new generation of wine artisans?”

Q.2 “Do not taste wine with too much expectations. Don’t put wine into a box. Climate does impact wine production in a big way but very interesting flavors and aromas can come year to year from climate change. These differences should be celebrated and appreciated.

Q.1 “More alcohol. Intense weather events affect the grapes (rain/drought). More sun exposure (more yield?). Different regions can grow wine, or some old are not ideal anymore.

Q.2 “Economic impact!! People’s livelihood depends on it!”

Q.1 “The areas where you can grow wine are going to change. More light and sun is going to change the flavor. Loosing biodiversity in the wine regions is finally going to thread wine production everywhere.”

Q.2 "You should not project your expectations on wine but let it be a living product. If you thread wine as a living product of a living ecosystem you find a way to deal with "bad years".

Q.1 "More sugar, more alcohol! Warmer weather means more sugar in the grapes which means higher alcohol. Also climate changes increases the amount of intense climatic events (like hurricanes) which may damage vines."

Q.2 "I've learned that climate change is not necessarily a bad thing in terms of wine production, and biodiversity is important for resilient grapes and resilient agriculture in general."

Q.1 "The climate/regions where you can grow grapes are changing. Places that weren't warm enough before, now can grow grapes, places that were fine before now are too hot to support successful vineyards."

Q.2 "I learned that small local vineyards with grapes that are seated to their region, sometimes produce the best wines."

Q.1 "Grenland and Alaska will produce some great wines?. Wine regions will move north. Grapes that can handle higher temperatures will become the norm for wine production. Declining numbers of Arthropods will negatively affect pollination."

Q.2 "I learned that it is the job of the person who owns the winery, to turn a "bad" year into an interesting and good wine."

Q.1 "Climate Change I believe will affect wine I a devastating way, in the growth of the grapes, the production of wine and the distribution/drinking of the product. In regions that rely on the profits from the wine industry they will suffer. Grapes will begin to grow in other regions more easily tha other. Climate change threatens everything!. Regardless of the "positive" effects like Alaska growing wine, the negative repercussions will prove the end of a thousands year old tradition and alter history."

Q.2 "I've learned that adverse conditions, which by popular assumption are bad for good wine, is not the truth and that wonderful things can come of it."

Annex 9 - Photos



