

MASTER THESIS

The Influence of Environment and Surroundings on Wine Tastings in Wine Tourism



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ABSTRACT

This study investigates the impact of environmental factors on wine tasting experiences, exploring how wineries and wine tourism establishments can tailor their settings to enhance the enjoyment and perception of their offerings. A comprehensive literature review was conducted, examining professional wine tastings in controlled "white rooms" and the influence of various internal and external factors such as lighting, sound, emotions, and landscapes. Following this, a blind tasting experiment was carried out in three different countries, focusing on the effects of extreme landscapes, specifically safari wildlife surroundings. The findings revealed that outdoor settings provided the most favourable tasting environment, significantly enhancing the perceived quality and enjoyment of the wine. Tasters consistently rated the same wine higher in pleasant, ambient settings, aligning with previous research by Spence et al. (2014), which suggests that sensory perception is heavily influenced by environmental context. Additional factors, such as natural lighting and social interactions, were found to further elevate the tasting experience. The study underscores the importance of creating dynamic and memorable environments for commercial and touristic wine tastings, in contrast to sterile professional tastings. It concludes that wineries should prioritise enhancing the overall tasting experience through thoughtful consideration of their surroundings.

Keywords: extreme landscape, environment, surroundings, tasting experience, safari

1. INTRODUCTION

1.1 Singita: Place of Miracles

Singita (www.singita.com), derived from the Shangaan language, translates to 'Place of Miracles'. Singita is a conservation and ecotourism brand that has been preserving Africa's wilderness for over three decades. In partnership with non-profit Funds & Trusts that implement strategic conservation projects in each region, Singita's one-hundred-year purpose is to preserve and protect large areas of African wilderness for future generations.

This purpose is enabled by providing tourism experiences through their luxury lodges across multiple countries and six different ecosystems. In total, Singita operates sixteen lodges in four countries: five lodges in Sabi Sand and Kruger, South Africa; two in Malilangwe, Zimbabwe; two in the Volcanoes National Park, Rwanda and seven in Serengeti, Tanzania (Figure 1). The first lodge, Ebony, opened in 1993 in the Sabi Sand. The company has grown over the years to become one of the world's leading conservation brands and one of the most sought-after Safari destinations. There are plans for expansion to further develop the company with new lodges in Botswana, Kenya, Namibia and Mozambique.

At every Singita lodge, the luxury offerings are supported by a strong wine program and wine tourism experiences. This starts with a dedicated wine storage and maturation facility in Stellenbosch where wines are selected, bought, matured and finally transported to the lodges. This is the hub of the wine operation and comprises a temperature and humidity-controlled maturation facility and temperature-controlled distribution system for every bottle that eventually makes its way to the lodges and camps. Each lodge possesses its wine cellar and selection of wines. Singita promotes South African wines and therefore doesn't offer other international wines. Wine activities are a key part of the guest experience and are strengthened at every lodge by a team of sommeliers, wine tastings in the bush, wine pairings and cellar dinners. These combined elements promote Singita as one of Africa's biggest wine collectors and the frontrunner in wine experiences at Safari lodges.

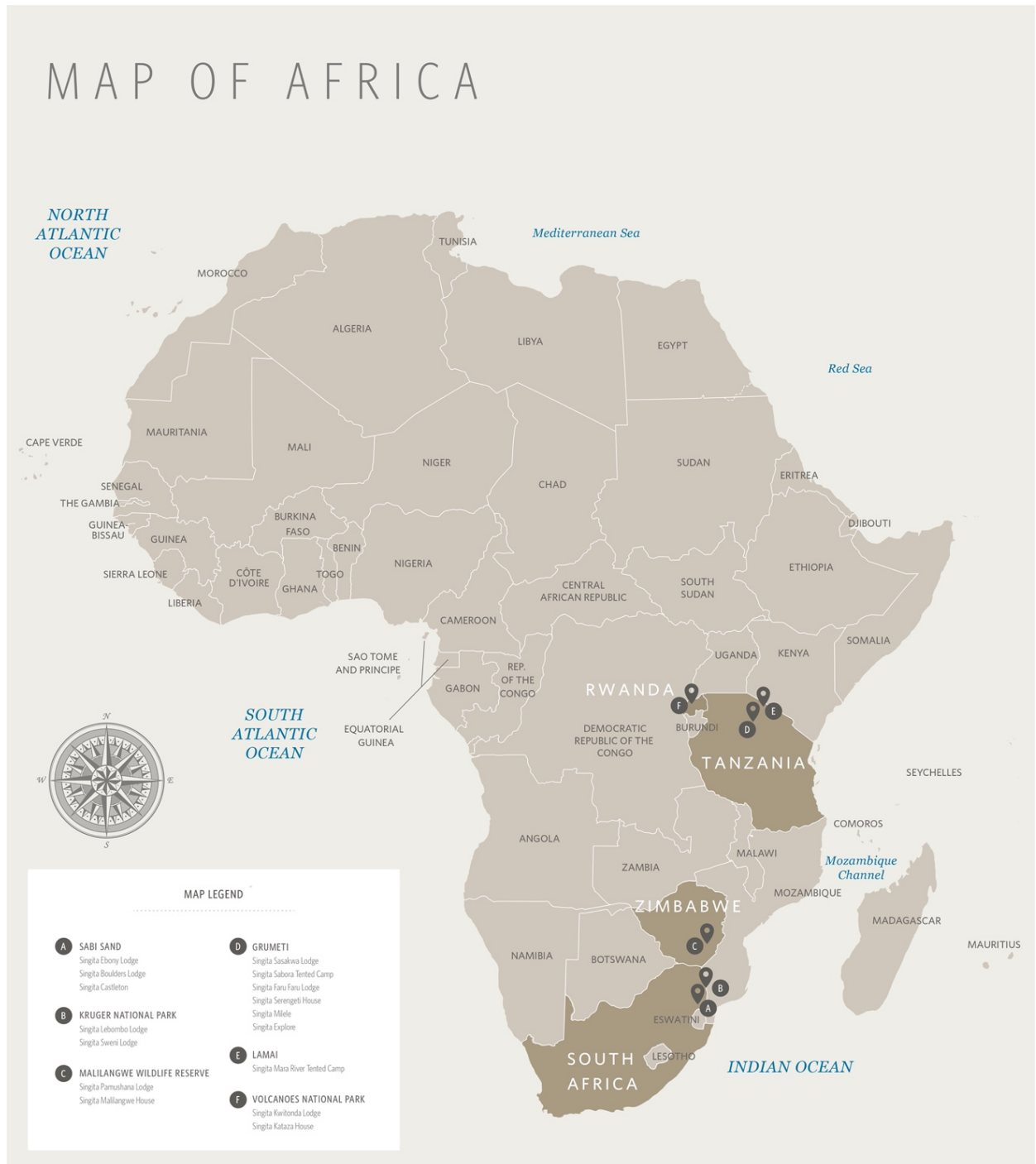


Figure 1 – Map of Singita's properties throughout Africa

1.2 Duties and activities during the internship

The student was hired by Singita's Premier Wine Director as a Roaming Sommelier, allowing him to travel and work at lodges across three different countries. Over four months, the student visited and worked at the five lodges in South Africa, the two lodges in Zimbabwe and the two lodges in Rwanda.

Training and induction were done for two weeks by the Professional Supervisor, François Rautenbach, at the Maturation Facility in Stellenbosch before travelling to the lodges. This training included an explanation of the wine program at Singita, the facility in Stellenbosch, professional tastings and events, meetings with winemakers and an in-depth exploration of the South African wine and hospitality industry.

After this induction period, the student travelled to Boulders, Ebony and Castleton lodges in Sabi Sand to work alongside the sommelier. His duties included understanding the global operation of the lodge, supporting the management team in place, training general staff, wine stewards and sommeliers, organising the cellar, and assisting the guests during lunch and dinner services, including wine tastings and bush stops. The time spent by the student in Sabi Sand was highlighted by the refurbishment of the wine cellar at Ebony and the arrival of highly wine-focused guests. The refurbishment allowed a deeper understanding of the wine cellar and the complete reorganisation of the wines displayed. The cellar at Ebony holds a total of four thousand bottles including hundreds of different styles of wines ranging from light-style whites to heavy and full-bodied reds. As mentioned previously, the wines are exclusively South African to showcase the potential of the country.

Tastings were hosted by the student at the request of the guests and occurred nearly daily. This would include cellar tastings, dinner tastings and bush tastings on game drives.

The student travelled further to the Kruger National Park lodges where most of his duties remained the same. His role shifted more towards staff training and special occasion tastings on game drives.

In Zimbabwe, the student focused extensively on reorganising the cellar and enhancing the inventory management system at the two lodges in Malilangwe Park. The primary goals were to streamline the storage and retrieval process, ensure accurate tracking of wine stocks, and improve overall cellar efficiency. The student undertook a comprehensive audit of the existing wine inventory, cataloguing each bottle to create a detailed and accurate inventory list. A new organisational system was implemented, categorising wines by type, vintage, and region to facilitate easier access and retrieval. Training sessions were conducted to familiarise the staff with the new inventory system and cellar organisation. Comprehensive presentations and tastings were provided to the wine stewards and staff, including detailed maps, charts and stories to enhance their understanding of wine.

Following the experience in Zimbabwe, the student moved on to Rwanda, where similar efforts were undertaken at the two lodges in the Volcanoes National Park, located in the north-eastern part of the country. An extensive review and reorganization of the cellar were carried out to improve inventory accuracy and operational efficiency. Wines were systematically categorized and stored to ensure optimal conditions and ease of access. A significant focus was placed on elevating the skills of the existing staff. One particular wine steward received extensive training to become a fully certified sommelier. The training program included simple wine education, practical tastings, and in-depth knowledge of wine service. This intensive training enabled the wine steward to manage the cellar and conduct professional wine tasting.

1.3 Proposal to be developed

The experience of wine tasting is profoundly influenced by the surrounding environment, with wines perceived and appreciated differently in sterile settings compared to enjoyable, relaxed, or impressive environments. This thesis investigates the psychological and sensory mechanisms underpinning this phenomenon, analysing the extent to which environmental factors impact wine perception and enjoyment.

One of the first notions taught during wine courses around the world is that the most appropriate and ideal tasting environment is a white room, with natural light, soundless and with no disturbing outside smells affecting the tasting.

However, wineries, restaurants and other places where tourist wine tastings occur rarely offer these settings to guests.

It is also commonly known and agreed that wine is better appreciated on holiday. Several factors may explain this phenomenon: the mindset and feelings of the taster and the different external environment and surrounding elements can all affect the overall appreciation of wine. Studies have proven that our senses play a fundamental part in the final recognition of wine – taste, sight, smell, hearing and touch can alter the perception of wine throughout a tasting. Studies show that the taster can maximise their senses and the tasting of wines in what will be referred to throughout this paper as the “white room”.

While these studies predominantly focus on tastings performed in controlled environments designated for wine professionals, the real-world settings of wine tourism present a contrasting scenario. Restaurants and wineries often have tasting rooms filled with exterior smells and sounds, different lighting, and varied colour surroundings. These elements are integral to the ambience but also introduce variables that can influence the tasting experience.

No study shows the positive or negative impacts of these different settings and surroundings on leisure wine tasting included in a wine tourism experience. This research aims to fill this gap by investigating whether wineries, restaurants, and other wine tourism establishments can replicate the "holiday feeling" and what positive or negative impacts such surroundings can have on wine tasting in a wine tourism setting.

This study hypothesises that the environmental and surrounding elements in wine tourism settings can positively influence the wine tasting experience by replicating the relaxed and enjoyable "holiday feeling".

This study aims to investigate the extent to which wine tourism establishments can replicate the "holiday feeling" through their environment and surroundings, assess the positive and negative sensory impacts of different environmental factors, including lighting, sound, and ambient smells, on the wine tasting experience, and provide recommendations for optimising the wine tasting environment in tourism settings to enhance guest satisfaction and wine appreciation. By exploring these objectives, this study seeks to offer valuable insights into the role of the environment in shaping wine tasting experiences, particularly within the context of wine tourism. This thesis aims to demonstrate to wineries that their offer of wine tourism cannot rely solely on the quality of the product and it is essential to provide an environment which enhances the overall experience of the tourist, which leads to a more positive perception in the wine which can therefore lead to increased sales and loyalty. Wine should be marketed and developed as an experience.

2. LITERATURE REVIEW

2.1 The "White Room" Concept

Studies and wine professionals have long advocated for optimal wine tasting conditions to include a quiet room free from large crowds and noise, devoid of distinctive or overpowering smells (odour-free), and well-lit with natural lighting (Wineware, 2024). Peynaud (1987) suggested that professional wine tastings should be conducted in silence. Lawless and Heymann (2010) emphasised that traditional sensory testing intentionally removes as many potential confounds as possible, including social interaction, light, colour, sound, and packaging. This environment is commonly known as the "white room," a concept referring to a controlled setting where tasting is optional with limited confounding factors.

2.2 Environmental Factors Affecting Wine Tasting

Wine tasting is a sensory experience influenced by various factors, including the environment in which it occurs. This thesis explores the impact of environmental context on wine perception, focusing on studies from sensory science, psychology, and marketing. It aims to understand how different settings can alter the tasting experience and the implications for the wine industry. The sensory perception of wine is not solely determined by its chemical composition. According to Spence, Wang, and Youssef (2017), environmental factors such as lighting, music, and ambience significantly affect how wine is perceived. These elements can enhance or diminish the sensory attributes of wine, altering its perceived quality and flavour profile. In their study,

Spence et al. (2014) demonstrated that wines tasted in different environments were rated differently by participants. The same wine was perceived as more enjoyable and higher in quality when tasted in a pleasant, ambient setting compared to a sterile, clinical environment. This suggests that sensory perception is not only a function of the wine itself but also the context in which it is consumed.

The psychological mechanisms of expectation and attention play crucial roles in how wine is experienced. Plassmann, O'Doherty, Shiv, and Rangel (2008) found that the perceived price of wine can influence taste perceptions. Participants who believed they were drinking an expensive wine reported it as tasting better than when they thought it was a cheaper wine, even though the wines were identical. This effect, known as the "placebo effect" of price, underscores the power of expectation in shaping sensory experiences. This psychological effect can be applied to situations in which consumers experience a 'better tasting' wine whilst in a pleasing environment rather than in lacklustre, devoid spaces. Similarly, attention to the tasting environment can modulate wine perception. Velasco, Jones, King, and Spence (2013) explored how different types of music influenced the taste of wine. Their findings indicated that classical music enhanced the perceived sophistication and enjoyment of wine, while pop music did not have the same effect. This suggests that attention directed towards the environment can influence sensory judgments and overall enjoyment.

Multisensory integration refers to the process by which the brain combines information from different senses to form a cohesive experience. Research by Seo, Hummel, and Kobal (2013) indicates that visual and auditory cues in the environment can interact with taste and olfactory senses, enhancing or detracting from the wine tasting experience. For example, the colour of lighting can affect the perceived flavour intensity of wine, with red lighting enhancing sweetness and white lighting enhancing acidity.

Contextual cues, such as the setting and social context, also play a pivotal role. The study by De Luca, Esteves, and Van Bavel (2020) delves into the influence of social context on wine tasting experiences. This research specifically examined how the presence of friends and the social dynamics of a tasting setting impact the perception and enjoyment of wine. The results revealed that wines tasted in the social setting with friends were rated significantly higher in terms of enjoyment and perceived quality compared to those tasted alone. Participants reported that the presence of friends and the lively, convivial atmosphere enhanced their overall experience, making the wine taste better. This highlights the importance of social interactions and the setting in shaping the overall wine tasting experience.

According to Pine and Gilmore (1998), the "experience economy" suggests that businesses that can create memorable experiences for their customers are more likely to achieve customer loyalty and advocacy.

The wine tasting experience is highly subjective and influenced by numerous factors beyond the intrinsic qualities of the wine itself. Contextual cues, such as the setting, temperature, and humidity, play significant roles in shaping the perception of wine. Recent research by Igarashi, Minagawa, and Ochiai (2019) highlights the potential of using artificial climate rooms to enhance the taste evaluation of wine by manipulating these environmental factors. Their study confirmed that adjusting temperature and humidity in an artificial climate room can change the taste evaluation of wine. This finding is pivotal as it suggests that the sensory quality of wine can be enhanced by optimising the environment in which it is served. Igarashi et al. (2019) stated, “we confirmed that we can change the taste evaluation of wine by adjusting temperature and humidity using the artificial climate room” and “this suggests the possibility to serve wine in a more optimal environment if we can identify the type of wine and person’s preference.” Furthermore, they noted, “sensory quality is influenced not only by taste but also by a variety of factors, such as olfaction, hearing, vision, and temperature and humidity. Overall quality is based on a combination of these sensory properties.” This shows that if we can specify the type of wine and a person’s preference, we can adjust the taste by adjusting the temperature and humidity. “In the future, it is thought that it will be possible to set up a small artificial climate room or similar device in restaurants to further enhance the taste of wine and food.”

The study conducted by Igarashi et al. (2019) suggests that by understanding the type of wine and an individual’s preference, the environmental conditions can be tailored to enhance the wine tasting experience. For instance, temperature and humidity were found to be crucial in influencing sensory perception. A cooler temperature might enhance the perception of acidity in white wines, while a slightly warmer environment could bring out the richness and complexity in red wines. Adjusting humidity can also impact the aroma and flavour profile, making the wine more enjoyable for the taster. The implications of these findings are significant for the hospitality and wine industries. If restaurants and wineries can identify the type of wine and a person's preference, they could potentially adjust environmental factors to enhance the sensory experience. Igarashi et al. (2019) suggest that in the future, it might be possible to set up small artificial climate rooms or similar devices in restaurants to further enhance the taste of wine and food. This approach could lead to a more personalised and enjoyable dining experience, potentially increasing customer satisfaction and loyalty.

The environment in which wine is tasted significantly impacts the perception and evaluation of the wine. This is highlighted in a study by Hannum, Forzley, Popper, and Simons (2015), which compared wine assessments conducted in traditional sensory testing booths to those conducted in an immersive and actual wine bar setting. Traditional sensory testing, as described by Lawless and Heymann (2010), is designed to isolate the consumer’s liking of the product by removing potential confounding factors such as social interaction, light, colour,

sound, and packaging. While this method aims to obtain unbiased sensory data, it fails to replicate the typical consumer experience, which is influenced by these very factors.

In traditional sensory evaluation booths, the consumer's experience is starkly different from their real-life wine-drinking scenarios. Stelick and Dando (2018) argue that such controlled environments strip away the contextual elements that significantly contribute to the overall enjoyment and perception of wine. This isolation can result in an evaluation that does not fully capture the consumer's genuine response to the product. In contrast, an immersive wine bar setting includes various sensory inputs such as ambient light, colour, sound, and social interactions, which are integral to the typical wine-drinking experience.

Hannum et al. (2015) found that wine assessments in a more naturalistic and immersive environment, like a wine bar, tend to provide a more accurate reflection of consumer preferences and perceptions. The wine bar setting, which mirrors the actual context in which consumers typically enjoy wine, allows for a more holistic evaluation that includes the influence of environmental factors. This setting can enhance the perceived quality of the wine due to the positive sensory contributions from the environment, such as pleasant lighting, appealing décor, background music, and social interactions.

The findings from Hannum et al. (2015) highlight the importance of considering the environment in sensory evaluations of wine. Traditional sensory booths, while scientifically controlled, may not provide the most relevant insights into consumer preferences because they lack the contextual richness of a real-world setting. By contrast, assessments conducted in immersive environments can capture the full spectrum of sensory experiences that influence consumer satisfaction. Spence (2020) elaborated on this, stating, "A growing body of experiential wine research now demonstrates that a number of contextual factors, including everything from the colour of the ambient lighting through to background music can exert a profound, and in some cases predictable, influence over the tasting experience." Spence also noted that the perception of wine itself and the wine-tasting experience more generally have been shown to be influenced by various factors, such as the weight of the wine bottle, the sound made by its closure, the glass from which it is drunk, and the multisensory environment in which it is consumed.

In addition to the influence of visual and auditory factors, Torrico et al. (2020) explored the effects of different virtual reality (VR) environments on wine tasting experiences. They found that "liking of the sensory attributes did not change under different environmental conditions. Emotional responses under bright-VR were associated with 'free', 'glad', and 'enthusiastic'; however, under traditional booths, they were related to 'polite' and 'secure'. 'Nostalgic' and 'daring' were associated with dark-VR. VR can be used to understand contextual effects on consumer behaviour." The use of VR in wine tasting research opens new avenues for exploring how different environments can impact sensory experiences and consumer behaviour. By

simulating various contexts, researchers can gain deeper insights into how environmental factors influence wine perception, providing valuable information for wineries, restaurants, and marketers aiming to enhance the consumer experience.

The context, or atmosphere, in which a wine is consumed also profoundly affects the tasting experience. This is acknowledged in the "Provencal rosé paradox," a phenomenon where a wine that tastes delightful on holiday often tastes very different and is much less enjoyable when sampled at home after one's return (Spence & Piqueras-Fiszman, 2014). This paradox highlights the influence of environmental and emotional context on wine perception. While on holiday, the positive emotions and relaxed state of mind contribute to a heightened sensory experience, making the wine taste better. Upon returning home, the absence of these contextual factors leads to a different, often less enjoyable, perception of the same wine.

Recent research has delved into the intricate relationship between wine and its environment, focusing on crossmodal correspondences and multisensory integration. For instance, Spence (2019) explored how different types of music can enhance the wine-drinking experience. The study found that classical music can make wine taste more sophisticated and enjoyable, while pop music did not have the same effect. This suggests that auditory cues can significantly influence the perception of wine, adding another layer to the sensory experience.

3. METHODOLOGY

The aim of this study is to analyse the different impacts that environment and surroundings can have on the overall wine tasting experience in a tourism setting. This was accomplished by conducting blind tastings in a variety of settings and environments, each selected to encapsulate intense and impressive examples of wine tourism and environments. The settings were carefully chosen to offer impressive and extreme conditions of wine tourism. Two different wines were used throughout all the tastings. The first wine is Alheit – Cartology 2018, a Chenin Blanc/Sémillon white blend from the Hemel-en-Aarde region in South Africa. The second wine is De Morgenzon – Maestro Red 2015, a Bordeaux blend from Stellenbosch, South Africa.

The blind tastings were conducted separately for a group of 20 tasters, who participated in pairs. Tasters were chosen randomly from Singita's guests during the student internship, over a period of four months (February – June 2024). The age range of the tasters spanned from thirty-two to seventy-six years old, and they were predominantly high-income guests. They identified themselves primarily as either occasional drinkers (consuming alcohol once a week) or regular drinkers (consuming alcohol three times or more a week). The tasters were mostly Americans but also included individuals from Mexico, France, Sweden, South Africa and Canada. Information about the tasters is available in Table 1 but the names are kept for confidential reasons.

Name	Age	Nationality	Consumption	Tasted in
Taster 1	60	USA	Occasional	South Africa
Taster 2	32	USA	Occasional	South Africa
Taster 3	37	Canada	Regular	South Africa
Taster 4	33	Canada	Regular	South Africa
Taster 5	48	USA	Regular	South Africa
Taster 6	71	USA	Regular	South Africa
Taster 7	62	USA	Occasional	South Africa
Taster 8	55	USA	Occasional	South Africa
Taster 9	74	France	Regular	South Africa
Taster 10	71	France	Regular	Zimbabwe
Taster 11	32	Sweden	Regular	Zimbabwe
Taster 12	71	Sweden	Regular	Zimbabwe
Taster 13	51	USA	Regular	Zimbabwe
Taster 14	63	USA	Regular	Zimbabwe
Taster 15	33	USA	Occasional	Zimbabwe
Taster 16	59	USA	Occasional	Rwanda
Taster 17	37	Mexico	Regular	Rwanda
Taster 18	42	Mexico	Regular	Rwanda
Taster 19	76	South Africa	Regular	Rwanda
Taster 20	69	South Africa	Regular	Rwanda

Table 1 – Information about the tasters

The tastings were carried out in three distinct countries, each with its own unique landscape and impressive environmental features. These countries were South Africa, Zimbabwe, and Rwanda. In each country, tastings took place in three different settings: a wine cellar, a lodge restaurant, and an outdoor location.

The outside tasting varied from country to country. In Rwanda (Figure 1), the tasting was held outside with view of the volcanoes and roaming buffalos with an average recorded temperature of 28°C. In South Africa (Figure 2), tastings took place during a game drive in a bush environment at sunset, potentially featuring the presence of various wild animals such as lions, leopards, elephants, rhinos, hippos, impalas, and diverse bird species. The recorded average temperature was 34°C. In Zimbabwe (Figure 3), tastings were held on a game drive, in a savanna environment, during sunset and included the same wildlife as South Africa with average temperatures of 32°C.



Figure 1 - Outside setting Rwanda



Figure 2 - Outside setting South Africa



Figure 3 - Outside setting Zimbabwe

The outdoor tastings were designed to immerse the tasters in the natural beauty of each country, providing a unique backdrop for each tasting.

The wine cellar tastings (Figure 4) were similar throughout each country and included a temperature-controlled room (15°C), with subdued lighting and no music playing. The wine cellar offered a controlled environment, allowing the focus to be solely on the wine itself.



Figure 4 - Wine cellar setting

The restaurants in the three different countries were also similar in settings and included exterior sounds from other guests, music and smells from the food offered in the restaurant. The restaurant setting (Figure 5) provided a more social context for the tasting, simulating a typical dining experience.



Figure 5 - Restaurant setting

Each taster accepted to participate in a blind tasting of the two mentioned wines in the three settings in a specific country. The tasters were not given any information about the wines prior to the tasting to ensure unbiased feedback. The tasters were asked to rate each wine at each

setting from 0 to 10. The scoring system was explained to each taster before the tasting began to ensure they understood how to rate the wines. The tasters were not informed about the identity of the wine they tasted and were unaware that they would be tasting the same wine three times. They were not informed of the purpose of the study until after all tastings were completed to prevent any bias in their ratings. Each wine was served at the same temperature and in the same order for the three settings. All wines were tasted in the same glassware and a new bottle was opened for every setting to avoid variances in oxidation of the wines.

This methodology was designed to ensure the integrity of the study while providing a unique and immersive experience for the participants. The blind tasting approach was chosen to eliminate any preconceived notions or biases towards the wines. The diverse range of environments and settings was intended to explore the impact of different sensory stimuli on the wine tasting experience. The selection of tasters aimed to capture a broad spectrum of wine consumers, from occasional to regular drinkers, and across a wide age range.

Upon completion of the tastings, the data collected was meticulously analysed to discern patterns and trends. Each wine's ratings across the different settings were compared to identify any significant variations in the scores. The analysis also took into account the individual characteristics of the tasters, such as their age and drinking habits. Statistical methods were employed to determine if the differences observed were statistically significant. The qualitative feedback provided by the tasters was also examined to gain insights into their overall experience and their perceptions of each wine in the different settings.

4. RESULTS AND DISCUSSIONS

4.1 South Africa

By organising blind tastings in three different settings, the study aimed to gather information, analyse the data and make observations on the achieved results. The scores are displayed in the Table 2 below.

Name	White Wine - Wine Cellar	White Wine - Restaurant	White Wine - Outdoor	Red Wine - Wine Cellar	Red Wine - Restaurant	Red Wine - Outdoor
Taster 1	5	6	7	7	7	8
Taster 2	7	7	8	5	7	8
Taster 3	8	8	10	6	8	10
Taster 4	6	6	7	6	6	6
Taster 5	4	6	7	8	8	9
Taster 6	7	8	9	7	7	9
Taster 7	5	5	7	6	8	7
Taster 8	6	8	7	8	9	10
Taster 9	6	6	7	6	8	9
Taster 10	7	9	10	7	7	8
Average	6,1	6,9	7,9	6,6	7,5	8,4

Table 2 - Blind tasting scores South Africa

Half of the tastings were organised in South Africa and the chart below shows the results of the white wine tasting in the three different settings.

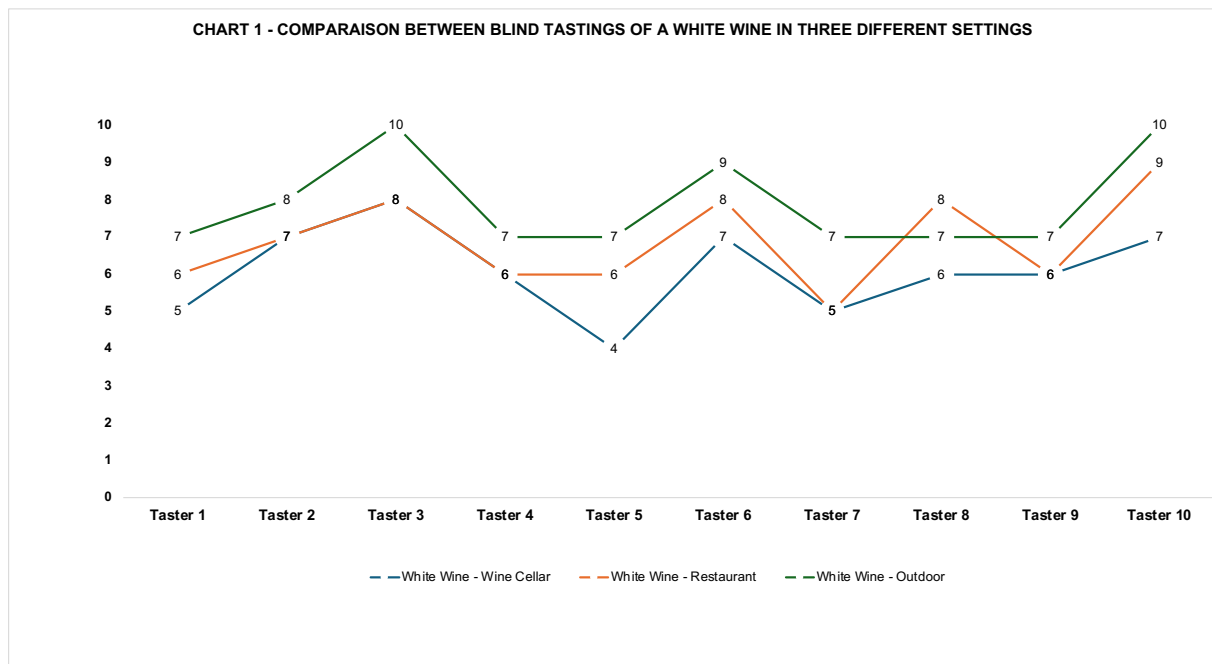


Chart 1 - This chart shows the scores given by ten tasters who tasted the same white wine (Alheit - Cartology 2018) in three different settings in South Africa. The green line represents the tasting outdoors, the orange the tasting at the restaurant and the blue line represents the tasting in the wine cellar. The tastings were performed over a period of four months (February – June 2024).

Chart 1 clearly indicates a difference between the different settings of the wine tastings. The outdoor setting obtained the highest scores by the majority of the tasters (except for taster 8). The outdoor setting obtained an average score of 7.9 out of 10. The outdoor setting also showed two maximum scores (10/10 for taster 3 and 10). Scores between tasters varied slightly by 3 points.

The restaurant setting varied heavily for each taster with a difference of 4 points between the lowest score (5/10 by taster 7) and the highest score (9/10 by taster 10). The restaurant setting averaged 6.9 out of 10 throughout the ten tastings. This placed the restaurant setting in the middle of the three tastings in terms of performance.

The lowest score came from the wine cellar tasting with more than half of the tasters giving the wine cellar their worst score. Overall, the wine cellar blind tasting averaged 6.1 out of 10.

The chart also clearly shows the difference between tasters and their opinions on the wine. However, we can conclude that all the tasters couldn't recognise the wine as the same between tastings because they scored them differently. We can also state through this chart that there is a correlation between the setting and the quality of the wine tasting, as the tasters ranked the wines in the same order throughout the three different settings (outdoors first, restaurant second, wine cellar third).

The chart below will display the results of the red wine tasting done by the same ten tasters in the same three settings.

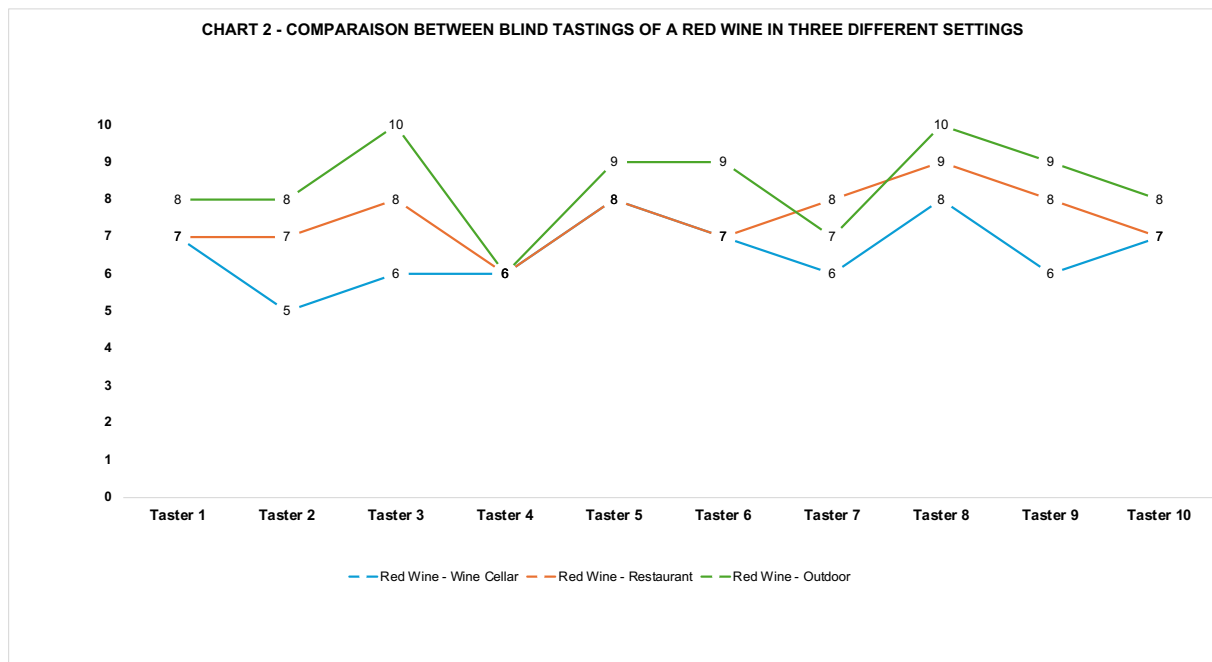


Chart 2 - This chart shows the scores given by ten tasters who tasted the same red wine (De Morgenzon – Maestro Red 2015) in three different settings in South Africa. The green line represents the tasting outdoors, the orange the tasting at the restaurant and the blue line represents the tasting in the wine cellar. The tastings were performed over a period of four months (February – June 2024).

We can observe the same pattern in Chart 2 that we found in Chart 1. The ten tasters scored the wines in the outdoor setting the highest, followed by the restaurant setting and finally the wine cellar. The variance in scoring was more present this time for the outdoor setting, with two maximum scores of 10/10 by tasters 3 and 8 and a minimal score of 6 by taster 6. It is worth noticing that taster 4 scored all three wines and each setting with the same 6 out of 10 score. Taster 4 was a wine enthusiast who had experience with South African wines, and he correctly guessed that the wines were identical throughout the three settings. The restaurant and wine cellar settings scores varied with 3 points between the lowest and highest scores. The outdoor setting averaged 8.4 out of 10, the restaurant 7.5 out of 10 and the wine cellar 6.6 out of 10.

An overview of the scores is given in the chart below. It represents a side-by-side comparison of the average scores of the tastings performed in the three different settings.

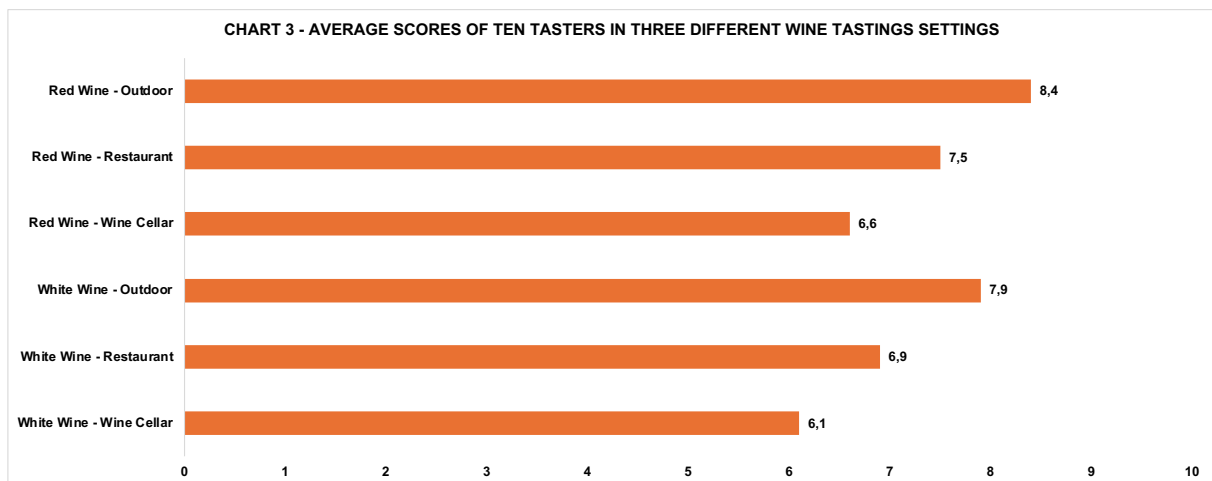


Chart 3 – This chart represents the average score of the ten tasters in the three different settings for both the white wine tasting (Alheit – Cartology 2018) and the red wine tasting (De Morgenzon – Maestro Red 2015) in South Africa. The tastings were performed over a period of four months (February – June 2024).

We can observe significant differences in the average scores of the different settings in Chart 3. For the white wines tasted, the outdoor setting scored 14,5% higher than the restaurant setting, and 29,5% higher than the cellar setting. For the red wine tastings, the outdoor setting also outscored by 12% the restaurant setting and by 27,2% the cellar setting. Overall, the outdoor setting outscored the restaurant by 13,2% (close to 1 point difference) and the wine cellar by 28,3% (close to 3 points difference).

The consistent ranking of the settings (outdoor first, restaurant second, wine cellar third) by the tasters strongly suggests a correlation between the tasting environment and the perceived quality of the wine. This indicates that the ambience and context in which the wine is consumed play a critical role in shaping the tasters' experiences and evaluations.

The outdoor setting, which achieved the highest average score, was clearly preferred by the majority of the tasters. The relatively narrow variation in scores (a difference of only 3 points among tasters) in this setting suggests a more uniform positive perception of the wine when tasted outdoors. This could be attributed to factors such as natural lighting, fresh air, and an impressive bush and wildlife environment, which might enhance the sensory experience and enjoyment of the wine.

In contrast, the restaurant setting, showed a wider variation in tasters' scores (ranging from 5 to 9). This greater disparity indicates that while some tasters found the wine quite enjoyable in a restaurant environment, others did not. Factors such as indoor lighting, noise levels, and the formality of the setting could contribute to these mixed perceptions. The variability in scores highlights how individual preferences and sensitivities to environmental factors can impact wine tasting experiences.

The wine cellar setting, which received the lowest average score of 6.1 out of 10, was clearly the least favoured. More than half of the tasters gave their lowest scores in this environment, suggesting that the cellar's characteristics—such as cooler temperatures, lower lighting, and

possibly a more enclosed space—detracted from the wine's perceived quality. This setting might evoke a more clinical or less comfortable atmosphere, potentially influencing tasters to rate the wine less favourably.

The differing scores across settings also imply that the tasters were unable to recognise the wine as the same across different environments. This highlights the powerful influence of the setting on their perception and evaluation of the wine. It suggests that external factors can significantly alter the sensory attributes perceived by the tasters, such as aroma, flavour, and overall enjoyment.

The study was extended to Zimbabwe to gather more information and data on different tasting settings. Zimbabwe offered a different outdoor setting, with more open spaces and savannah surrounding, whilst still displaying the same wildlife as South Africa.

4.2 Zimbabwe

In Zimbabwe, the blind tastings were held for 5 tasters in three different settings (outdoor, restaurant and wine cellar). The scores are displayed below in Table 3.

Name	White Wine - Wine Cellar	White Wine - Restaurant	White Wine - Outdoor	Red Wine - Wine Cellar	Red Wine - Restaurant	Red Wine - Outdoor
Taster 1	8	9	9	5	6	8
Taster 2	6	7	9	4	6	8
Taster 3	7	8	10	8	8	10
Taster 4	7	6	7	4	6	8
Taster 5	6	7	9	5	8	9
Average	6,8	7,4	8,8	5,2	6,8	8,6

Table 3 - Blind tasting scores Zimbabwe

The chart below shows the scores of the white wine tasting.

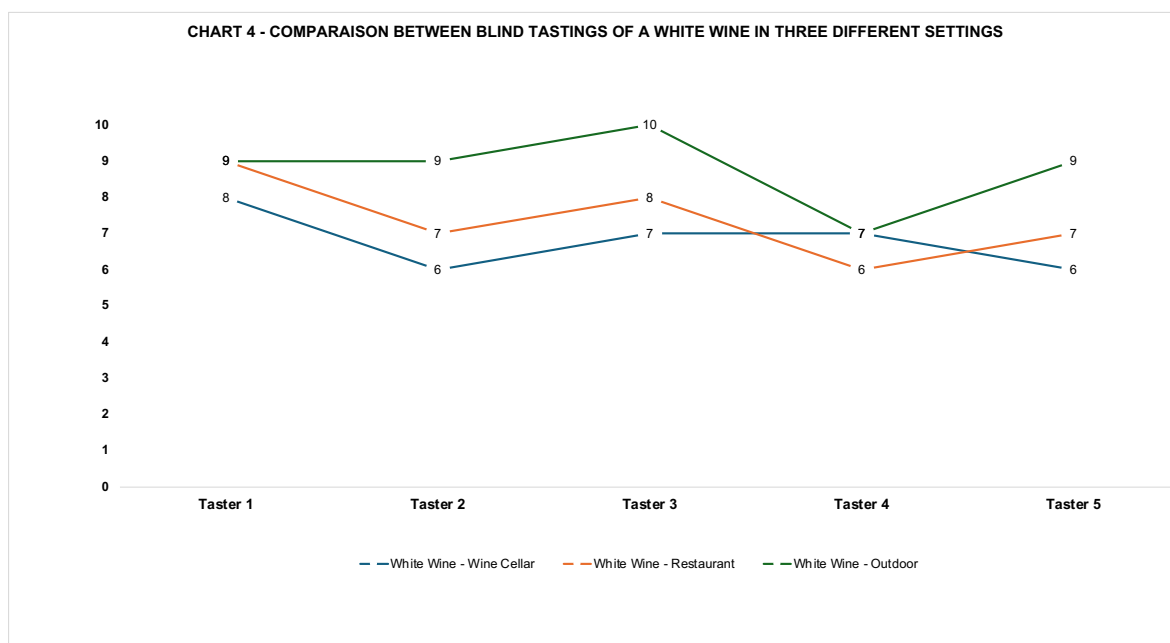


Chart 4 - This chart shows the scores given by five tasters who tasted the same white wine (Alheit - Cartology 2018) in three different settings in Zimbabwe. The green line represents the tasting outdoors, the orange the tasting at the restaurant and the blue line represents the tasting in the wine cellar. The tastings were performed over a period of four months (February – June 2024).

We can observe in Chart 4 that once again, the outdoor setting received the highest scores from the tasters with an average of 8.8 out of 10. The restaurant setting came second with an average of 7.4 out of 10 and the wine cellar last with an average of 6.8 out of 10. The variance of the scores between tasters was less important with a difference of 3 points for the outdoor settings, 3 for the restaurant setting and only 2 for the wine cellar. Only one taster gave a maximum score of 10 out of 10 in the outdoor setting.

These results once again imply that the tasters were unable to recognise the wine as the same across different environments. The results also show that the outdoor setting was preferred as a wine tasting environment.

The same data analysis was done for the red wine in the three different settings, as shown below.

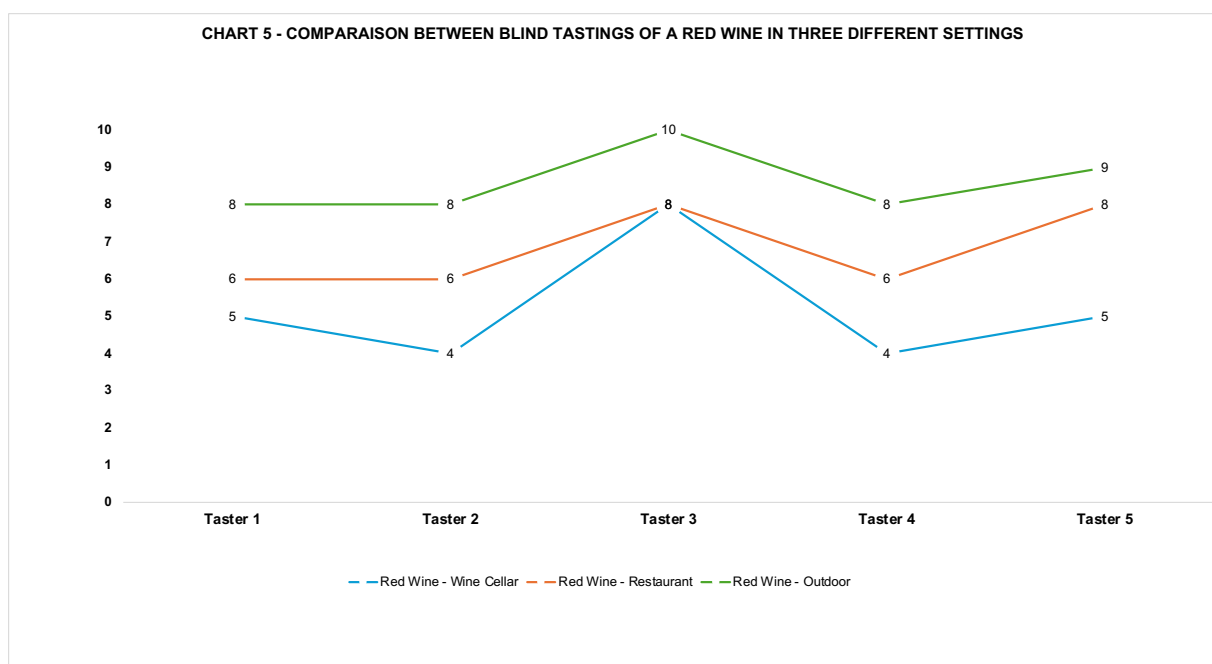


Chart 5 - This chart shows the scores given by five tasters who tasted the same red wine (De Morgenzon – Maestro Red 2015) in three different settings in Zimbabwe. The green line represents the tasting outdoors, the orange the tasting at the restaurant and the blue line represents the tasting in the wine cellar. The tastings were performed over a period of four months (February – June 2024).

Chart 5 shows an even bigger difference between the blind tastings, with the outdoor setting receiving the highest scores with an average of 8.6 out of 10, the restaurant an average of 6.8 out of 10 and the wine cellar the lowest average score with 5.2 out of 10.

It is important to note that the scores for the wine cellar were extremely low compared to the other scores, with two 4/10 scores.

This emphasizes the observation that the wine cellar seems to be a complicated environment to taste wine in, although a neutral environment, it doesn't offer external factors that would benefit the wine appreciation.

The final overview of the tastings done in Zimbabwe is showcased in the graph below, representing the average of the six blind tastings (three for the red wines and three for the white wines).

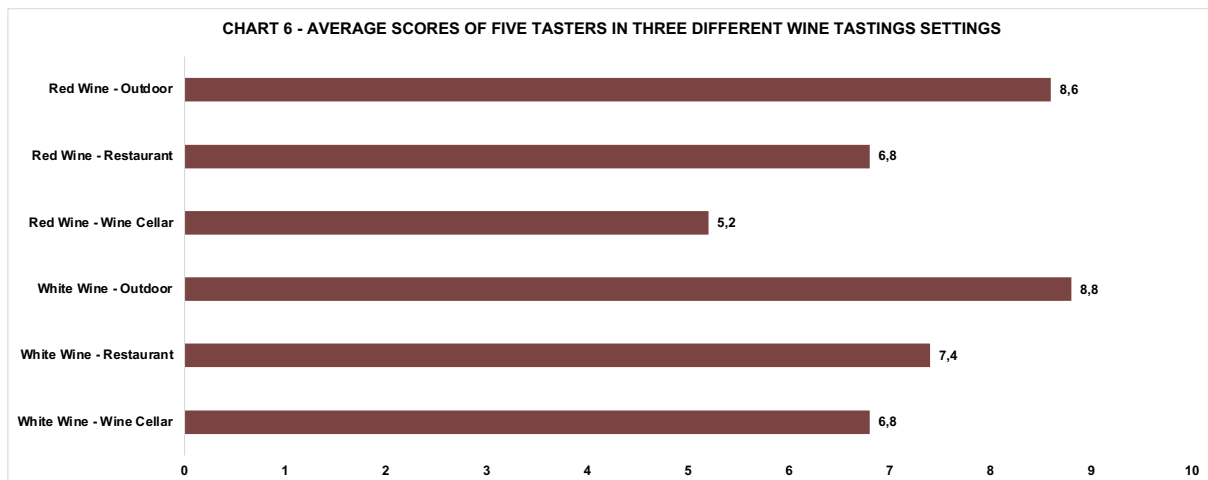


Chart 6 – This chart represents the average score of the five tasters in the three different settings for both the white wine tasting (Alheit – Cartology 2018) and the red wine tasting (De Morgenzon – Maestro Red 2015) in Zimbabwe. The tastings were performed over a period of four months (February – June 2024).

Chart 6 solidifies the results obtained in the tastings in South Africa. Although the outside setting slightly changed in Zimbabwe, it remained the preferred tasting environment with the highest averages in both red and white.

The tasters still consistently ranked the settings in the same order (outdoor first, restaurant second, wine cellar third), indicating a strong correlation between the tasting environment and the perceived quality of the wine.

For the white wines tasted, the outdoor setting scored 18,9% higher than the restaurant setting, and 29,4% higher than the cellar setting. For the red wine tastings, the outdoor setting also outscored by 26,5% the restaurant setting and by 65,4% the cellar setting. Overall, the outdoor setting outcores the restaurant by 22,5% (close to 2 points difference) and the wine cellar by 45% (close to 4 points difference).

These results confirm the observations made above for the tastings in South Africa. Guests couldn't recognise the wine as the same during the three tastings and preferred the wines tasted in a busier, externally influenced environment over the neutral settings of the wine cellar. The temperature in Zimbabwe may have played a significant role in the lower scores of the wine cellar. The outside temperature was very high (more than 32°C) and the difference with the temperature in the wine cellar (15°C) may have caused an influence on the wine tasted.

The final part of this study showed the results of the tastings done in Rwanda. The outdoor setting changed considerably compared to South Africa and Zimbabwe. Rwanda's Volcanoes National Park offers a completely different environment, with a lot of greenery, volcano mountains and less wildlife than the two other countries.

4.3 Rwanda

The Volcanoes National Park was the last place where the tastings were done for this study. The Park offers a unique landscape that includes volcano mountains and green hills.

Table 4 shows the scores of the wine tastings done in Rwanda.

Name	White Wine - Wine Cellar	White Wine - Restaurant	White Wine - Outdoor	Red Wine - Wine Cellar	Red Wine - Restaurant	Red Wine - Outdoor
Taster 1	5	7	9	6	7	8
Taster 2	7	8	9	7	6	8
Taster 3	5	8	9	6	8	10
Taster 4	6	6	7	7	6	8
Taster 5	6	8	9	8	8	9
Average	5,8	7,4	8,6	6,8	7	8,6

Table 4 - Blind tasting scores Rwanda

The chart below shows the tastings done by five tasters in three different settings.

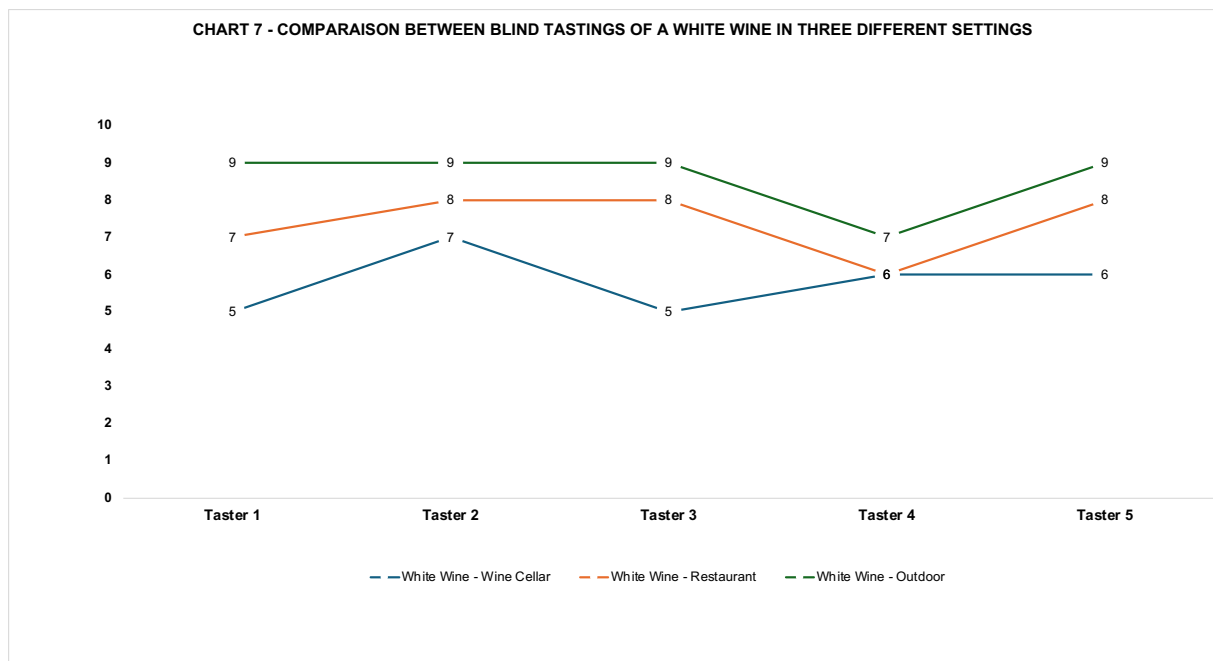


Chart 7 - This chart shows the scores given by five tasters who tasted the same white wine (Alheit - Cartology 2018) in three different settings in Rwanda. The green line represents the tasting outdoors, the orange the tasting at the restaurant and the blue line represents the tasting in the wine cellar. The tastings were performed over a period of four months (February – June 2024).

Just like in South Africa and Rwanda, Chart 7 shows that the outdoor setting, although different, still scored the highest in the blind tastings with an average of 8.6 out of 10. The restaurant setting scored consistently as the second-best environment with an average of 7.4. The wine cellar showed the lowest scores, averaging 5.8 out of 10.

The variance between scores is very constant, with only 2-point differences in all of the three settings. These results confirm the observations made in South Africa and Zimbabwe.

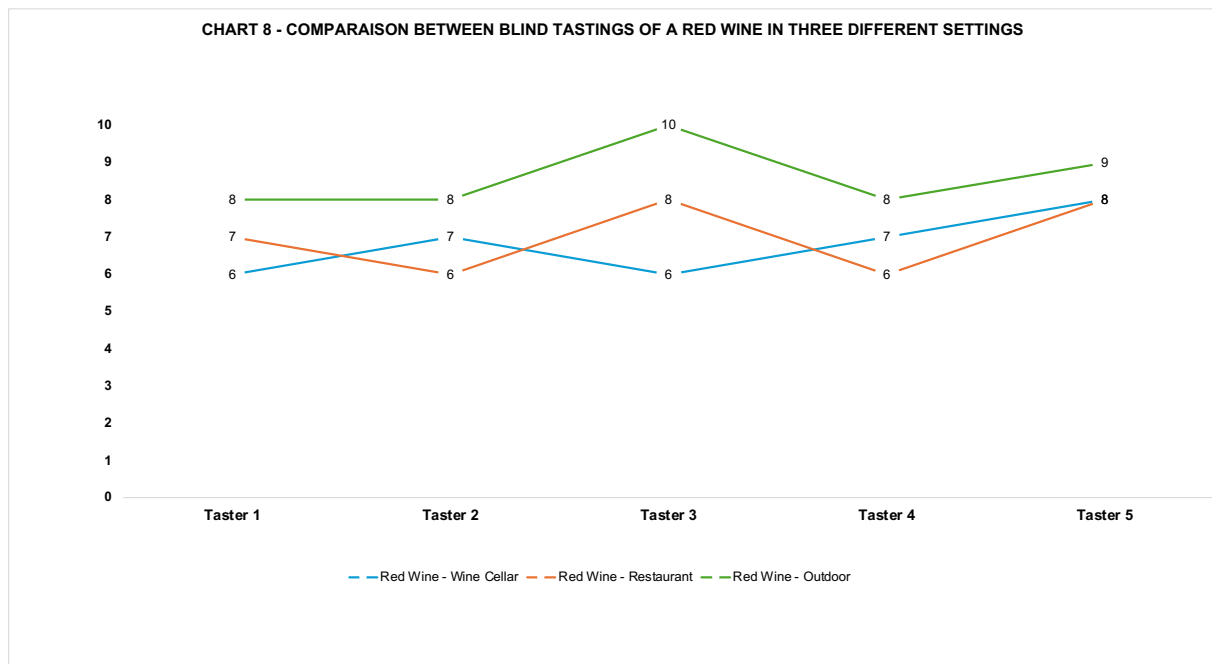


Chart 8 - This chart shows the scores given by five tasters who tasted the same red wine (De Morgenzon – Maestro Red 2015) in three different settings in Rwanda. The green line represents the tasting outdoors, the orange the tasting at the restaurant and the blue line represents the tasting in the wine cellar. The tastings were performed over a period of four months (February – June 2024).

We can observe on Chart 8 a slightly different score variation than on the previous tastings. The outdoor setting still averages the highest score with 8.6 out of 10 but the wine cellar setting is in this case much closer to the restaurant setting with 6.8 out of 10 compared to 7 for the restaurant. This can be explained by the constant presence of a fireplace in the restaurant in Rwanda, not present in South Africa and Zimbabwe. This didn't affect the scoring for the whites however affected slightly the red wine tasting.

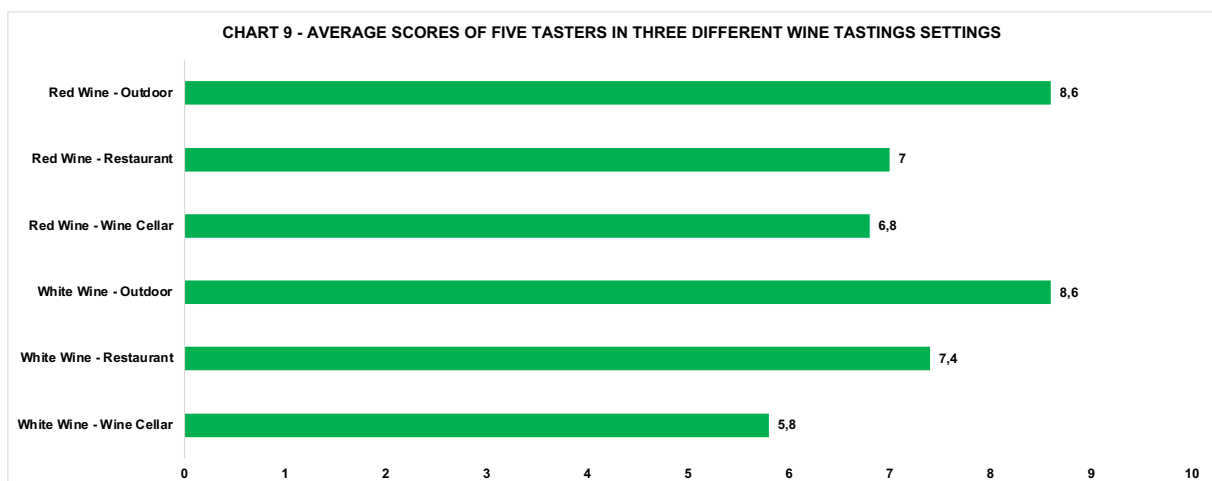


Chart 9 – This chart represents the average score of the five tasters in the three different settings for both the white wine tasting (Alheit – Cartology 2018) and the red wine tasting (De Morgenzon – Maestro Red 2015) in Rwanda. The tastings were performed over a period of four months (February – June 2024).

The overview of the tastings in Rwanda is showcased on Chart 9 and follows the same results and observations made in South Africa and Zimbabwe. The outdoor setting is still the highest-

scoring setting and remains the most appreciated wine tasting environment of this study. Although closer to the restaurant setting than in the tastings in South Africa and Zimbabwe, the wine cellar remains the lowest-scoring tasting environment.

For the white wines tasted, the outdoor setting scored 16,2% higher than the restaurant setting, and 48,2% higher than the cellar setting. For the red wine tastings, the outdoor setting also outscored by 22,9% the restaurant setting and by 26,5% the cellar setting. Overall, the outdoor setting outscores the restaurant by 19,4% (close to 2 points difference) and the wine cellar by 36,5% (close to 4 points difference).

4.4 Discussions

The wine tasting study conducted across South Africa, Zimbabwe, and Rwanda provides clear evidence of the significant impact of the tasting environment on the perceived quality of wine. Across all regions and settings, the outdoor environment consistently received the highest scores, indicating that tasters found the wines most enjoyable in an open, natural setting. This was followed by the restaurant setting, and lastly, the wine cellar setting, which received the lowest scores.

The consistency of these results across different countries and tasting contexts underscores the correlation between the environment and the sensory perception of wine. Factors such as natural lighting, fresh air, and scenic surroundings in the outdoor settings likely enhanced the overall tasting experience, contributing to higher scores. In contrast, the more controlled and enclosed environment of the wine cellar seemed to detract from the wine's appeal, resulting in lower scores. Temperature appears to highly affect the scores, with higher temperatures scoring better than lower temperatures (Table 5).

Furthermore, the study highlights that tasters were unable to recognise the wine as the same across different settings, suggesting that environmental factors can significantly alter the sensory attributes perceived, such as aroma and flavour. This finding is crucial for the wine industry as it emphasises the importance of context in wine tasting and marketing.

The results from Rwanda, with its unique landscape of volcano mountains and green hills, align with those from South Africa and Zimbabwe, reinforcing the preference for outdoor settings. The slight variations observed, such as the closer scores between the wine cellar and restaurant in Rwanda for red wines, suggest that specific environmental elements, like the presence of a fireplace, can influence the tasting experience to some extent.

NEGATIVE IMPACT	POSITIVE IMPACT
Controlled and enclosed environments	Natural lighting
Lack of natural lighting	Fresh air
Lower temperatures	Scenic surroundings
	Higher temperatures

Table 5 – Overview of positive and negative impacts on wine tastings.

The left column shows factors that can negatively impact wine tastings and the right column shows the factors that positively impact them.

5. CONCLUSION

This study aimed to analyse how an environment can impact positively and negatively wine tastings and how wineries and other wine tourism establishments can cater their tastings to different surroundings and settings.

The study first analysed the existing research done on all aspects of wine tasting, including professional wine tasting in “white rooms” and the effect of internal and external aspects such as lighting, sound, feelings and landscape. The study then offered the results of a blind tasting experiment done in three different countries. The experiment showed the impact of “extreme” landscapes, in this case safari wildlife and surroundings. The consistent results of the experiment showed that the outdoor setting was the best-tasting environment. Additionally, the experiment proves that tasters are unable to recognise the wine as the same across different settings, suggesting that environmental factors have a significant impact on the sensory attributes perceived, such as aroma and flavour. This emphasizes the results of the research done by Spence et al in 2014 and provides an additional argument that the same wine is perceived as more enjoyable and higher in quality when tasted in a pleasant, ambient setting compared to a sterile, clinical environment. This ambient setting is displayed in the experiment as the restaurant and outdoor setting, both outscoring the more sterile environment of the wine cellar. As described in the literature review, the colour of lighting can affect the perceived flavour intensity of wine, with red lighting enhancing sweetness and white lighting enhancing acidity (Seo, Hummel, Kobal, 2013). This explains the higher scores perceived in the outdoor setting, where natural lighting is abundant compared to the wine cellar.

Wines tasted in social environments with friends and family tend to score higher (De Luca, Esteves, Van Bavel, 2020) confirming the results as the outdoor and restaurant settings were performed with other guests and staff around whereas the wine cellar setting allowed for a more individual environment.

The results obtained throughout this study can be explained by a variety of factors and are often the combination of different sounds, lighting, landscapes and social environments.

The study proved that the environment and surroundings play a major role in the perception of the quality of a wine. It also proved that outdoor and social settings are beneficial environments

for tasting wines. Further research will need to be done in order to quantify to what extent each environmental aspect affects the wine perception.

The limited amount of tastings, the selection of only one white and one red wine as well as the very specific social status of the group of tasters (extremely high-income guests) offer limits to this study and more research in the future should consolidate the results obtained in this research paper.

Finally, this study shows that the environment and surroundings in wine tastings are crucial to a more enjoyable experience for the guests. Wineries should observe and analyse the environment where their guests are tasting the wines and adapt these conditions to enhance the experience. This is achieved by offering a dynamic and memorable experience through landscapes, sounds, lighting and social interactions. Sterile and “white room” tastings should remain the norm for objective and professional tastings, but are not suited for commercial and touristic wine tastings. Therefore, this study aligns with the principles of the experience economy, as outlined by Pine and Gilmore (1998), which emphasises that businesses creating memorable experiences are more likely to achieve customer loyalty and advocacy. Thus, wineries should prioritise the overall tasting experience to distinguish themselves in a competitive market.

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