

Climate change threats to a floral wedding: Threats of shifting phenology to the emerging South African wedding industry

Mazozo M. Mahlangu^{1, DFMR}, Jennifer M. Fitchett^{2, CDMR}

University of The Witwatersrand, Johannesburg, ¹email: tmnmahlangu@gmail.com, ²email: Jennifer.Fitchett@wits.ac.za (corresponding author)

How to cite:

Mahlangu, M.M. and Fitchett, J.M. (2019). Climate change threats to a floral wedding: Threats of shifting phenology to the emerging South African wedding industry. *Bulletin of Geography. Socio-economic Series*, 45(45): 7-23. DOI: <http://doi.org/10.2478/bog-2019-0021>

Abstract. Wedding tourism is a fast emerging niche market both globally and in South Africa, as destination weddings are becoming increasingly popular. Wedding industries across the world, and specifically in South Africa, are increasingly dependent on the natural environment. Wedding venues with floral gardens, farms, orchards or forests are particularly popular. Beyond the venue, flowers are important for the bouquets and decoration, with popular blooms changing year on year. Shifting phenology – the timing of annually recurrent biological events – has been identified as one of the most sensitive responses to climate change. This poses a threat to the sustainability of floral wedding venues and the floral industry relating to weddings. This exploratory study utilizes an interdisciplinary mixed-method approach to record the importance of flowers in South African weddings and the perceived threats of climate change to this subsector. The respondents reveal the importance of flowers and the outdoors in both symbolism and the enjoyment of the wedding day, and had organised their wedding date to align with flowering. Destinations highlight a lack of awareness regarding phenological threats and are relatively unperturbed about the threats of climate change. Comparison to global phenological shifts reveals that these are misplaced. There is, therefore, a need for such wedding venues to adopt adaptive strategies to preserve their environment which drives wedding tourism.

Article details:

Received: 11 March 2019
 Revised: 02 July 2019
 Accepted: 10 August 2019

Key words:

Wedding Tourism,
 Destination Weddings,
 Climate Change,
 Shifting Phenology

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1. Introduction

The wedding industry and wedding tourism in South Africa are lucrative, but emerging economic subsectors (de Witt, 2006; Rogerson, Wolfaardt, 2015). The sector incorporates a large number of small enterprises, who fill market niches as they develop (Booyens, Visser, 2010). It is therefore important to predict and mitigate future risks posed to this sector, to protect its sustainability (de Witt, 2006). Due to the vast cultural diversity in wedding practices at the global and local scale, the focus of this study is primarily on 'white weddings'. Formal white weddings are based on European cultural practices, which have been popularised throughout the years and furthermore, accepted as wedding 'norms' globally (Mupotsa, 2014). Nonetheless, flowers have traditionally been a key element in an array of different cultural wedding rituals, identified as a symbolic representation of love: from flowers in the décor to venues characterised by flower gardens (Chesser, 1980; Donohoe, 2008). For wedding ceremonies for which flowers are important, the availability of flowers of a preferred species at the timing of the wedding is thus imperative (Donohoe, 2008). An even greater reliance has been placed on the timing of flowering as destination weddings have increased in popularity, and couples have sought venues with gardens, orchards or floral displays as a primary attraction (Rogerson, Wolfaardt, 2015; Etemaddar et al., 2018). Therefore, the ability of the wedding destination and wedding planners to accurately determine the flowering date of the species of preference is imperative.

Phenology refers to the timing of annually recurrent biological events (Badeck et al., 2004). As a result of climate change, the threshold temperatures required for bloom are experienced increasingly earlier in the year, in months previously classified

as winter. Since 1980, there has been a mean advance in the timing of phenological events at a rate of 4.0 days per decade, as a result of global warming (Kharouba et al., 2018). This means that many species are flowering half a month earlier now than in 1980. For South Africa, these advances have been slower, yet remain statistically significant (Fitchett, Fani, 2018). Apple and pear tree flowering is advancing at 1.6 days per decade (Grab, Craparo, 2011), while Jacaranda tree blossoms are advancing at a rate of 2.4 days per decade, flowering a month earlier today than they did in 1920 (Fitchett, Fani, 2018). Coupled with the advance in flowering dates, is an increase in the spatio and temporal variability of their timing (Fitchett et al., 2015). This poses a threat to the wedding subsectors that rely heavily on the flowering of specific species, as their timing will become increasingly random and difficult to project. The threat is heightened in the context of a wedding industry in which bookings are often made more than a year in advance, vastly increasing the margin of error in a changing climate. As South African destinations are drawing in wedding tourists both locally and from abroad (Major et al., 2010), and premiums are placed on 'in-season' weddings (Getz, 2008; Rogerson, Wolfaardt, 2015), the awareness of climate change impacts on the timing of flowering is of critical importance to the sector.

This study explores this intersection between the scientific examination of phenology shifts in flowering seasons under climate change, and the commerce and social sciences of wedding event management, cultural symbolism in weddings, and changing demands in the wedding sector. Through a series of in-depth, semi-structured interviews, we undertake a pilot study exploring the perspective of couples who held their weddings at floral destinations and of the managers of some of these destinations. We compare these perceptions to the rates of

phenological shift observed for the species in question, where possible, in an attempt to quantify the future threats.

1.1 Wedding Tourism, Wedding Destinations and Floral Venues

Literature on weddings and wedding tourism is fairly scarce, particularly for the South African wedding tourism industry (Rogerson, Wolfaardt, 2015). Throughout history, weddings have gained substantial social and cultural meaning as a rite of passage and have been perceived as a ‘once-in-a-lifetime’ occasion (Chesser, 1980; Bambacas, 2002; Mupotsa, 2014; Rogerson, Wolfaardt, 2015). Due to the diverse socio-cultural reality of South Africa, and the world at large, there is a wide array of cultural and traditional wedding practices that are incorporated in contemporary weddings, depending on the religions, cultures and/or ethnicities of the bridal couple. Some practices which are characteristic of ‘white weddings’ include the bride’s white or ivory dress and veil; a groom’s suit; the exchanging of rings, wedding vows and a kiss; cutting of cake or the throwing of the garter and the bridal bouquet (Chesser, 1980; Bambacas, 2002; Pauli, 2013; Mupotsa, 2014). In South Africa, many African bridal couples host two weddings: a tradition wedding (based on cultural practices such as *lobola* negotiations), followed by a ‘white wedding’ (Mupotsa, 2014). The role of flowers in weddings has consequently become cross-cultural.

Destination weddings have been identified as a leading global wedding trend (Major et al., 2010). As hallmark events, personal preferences influence all wedding related decision-making (Getz, 2008; Todd et al., 2017). These decisions factor in intrinsic and extrinsic factors, which are influenced by personal values or meaning-making and marketing strategies (Lau, Hui, 2010), thus, a wedding venues needs to provide services which connect to each of these contributing factors (de Witt, 2006). Financial influences are among the most crucial contributing factors and scholars have argued that destination weddings have been calculated to be cheaper than tradition wedding and honeymoon costs combined (Seebaluk et al., 2015; Marais et al., 2016; Etama-

ddar et al., 2018). On the contrary, hallmark events may cause couples to choose to have a spectacular wedding experience because of the once-in-a-lifetime connotation and to escape everyday routine or the socio-cultural pressures (Seebaluk et al., 2015; Etamaddar et al., 2018). Increasingly, “[a] wedding [needs to be] packaged as an entire experience” (Rogerson, Wolfaardt, 2015, 2-3).

The intersection between hosting a wedding and the travel required to attend said wedding is known as wedding tourism, a recently emerging component of event tourism (Getz, 2008; Rogerson, Wolfaardt, 2015; Marais et al., 2017). Getz (2008) identifies events as a very significant influencer of tourism and states that many destinations and venues often integrate hosting events as a key part of their marketing and development strategies. Thus, venues and destination ought to capitalize on that which makes their location ‘unique’ as a key marketing strategy in a competitive market and to contribute to place-making (Getz, 2008; Rogers, Davidson, 2015; Todd et al., 2017). It has been argued that destinations are increasingly becoming service providers for customers who are searching for unique experiences (Marais et al., 2017). The marketing strategies and the features of a destination are two critical factors that influence one’s personal choice in considering destinations (Seebaluk et al., 2014). The natural appeal of a destination has been emphasised to be a lucrative feature for wedding venues (Seebaluk et al., 2014; Rogerson, Wolfaardt, 2015; Bertella, 2017; The Wedding Academy, 2018). Niche tourism, such as this, is driven by the attractiveness and marketability of a destination that advertise itself to a micro-niche target market through a “narrowly defined group of interests” (Rogerson, Wolfaardt, 2015, 2).

1.2 The Symbolism of Flowers in Weddings

In historical western wedding culture in the global sphere, flowers have traditionally been an integral part of white weddings (Chesser, 1980). Chesser (1980) identifies garlands as representations of a ‘bride’s virtue’, which was later became bouquets, during the Victorian era. Flowers in decor were symbols of future abundance and celebration (Chesser, 1980). Flower girls sprinkling the pet-

als from flowers represented a multitude of possible meanings according to the type of flower used for the petals (Chesser, 1980). Historical in Japanese wedding culture, a flower presentation represents an exchange of gratitude from the newlywed couple to their parents (Edwards, 1987).

In present-day modern wedding practices, such remnants still exist in white wedding culture, which have become popularised. With homogeneity, some of these meanings were lost or reimagined by the manner in which white weddings have been practised across the world. The symbolism of flowers has moved from deep specificity and cultural meaning to couples choosing certain flower simply for their beauty and personal meaning (Chesser, 1989). Donohoe (2008) argues that flowers have become an international symbol and celebration of love, with particular reference to Valentine's Day – with some flowers, for example red roses, representing romantic love.

2. Material and Research Methods

This research project will use a mixed-methods approach, based on wedding tourism literature (see Rogerson, Wolfaardt, 2015) and phenology literature (Fitchett, Fani, 2018; Fitchett, Ebhuoma, 2018). Both qualitative and quantitative data was collected and analysed in attempts to addressing the aim and objectives of this study. Techniques from human geography were used through key informant interviews.

Key informant semi-structured interviews were the primary method used in this study to determine experiences of flowering at wedding destinations, and perceptions regarding the threat of climate change. In this regard, perceptions are defined as the interpretation of one's sensory experience and response to an environment or a phenomenon (Gössling et al., 2006). These interviews were primarily conducted with clients of wedding venues, as in most instances the wedding venue employees were unwilling to be interviewed. The contact details of the wedding venues were obtained from the website pages of each venue and through email correspondence (Archie, 2018), while floral wedding clients were notified about the study via so-

cial media, through which they volunteered to be interviewed.

The interview contained 28 questions which explored the booking processes, weather and climate of the destination and during the peak wedding season, concerns and expectations regarding the natural environment, motivations for hosting a nature-based wedding, perceptions on climate change and future wedding preferences. All interview responses were coded through thematic analysis, and key quotes extracted to demonstrate common themes.

The selection of study sites was determined primarily by the responses from the interviewees, who each identified the location of their floral wedding. A diverse group of study sites resulted, spanning a range of biomes and climatic zones across South Africa (Table 1). A total of six interviews were conducted with clients who had been married at wedding venues located in South Africa, which either has a floral garden, orchard, farm or forest. To extend the spatial coverage to include the South-western Cape, the Stellenbosch Wine Farm was included in the study as a representative was willing to be interviewed. Three further destinations which market themselves as hosting floral weddings were approached, but were not willing to be interviewed (Figure 1). For the Fouriesburg Cherry Farm in the Free State, both a client and a representative from the destination were willing to be interviewed.

3. Results

3.1 Customers' Perspectives

The six customer respondents, referred to by letter from A-F, comprised a relatively wide demographic. One couple are same-sex, one is mixed-race, and one live abroad, choosing a destination wedding in South Africa as this is their place of birth. Their wedding dates are distributed throughout the year, with two coincidentally close in date in April. Consequently, they report a wide range of weather conditions on their wedding day. Clear or sunny conditions were reported by four of the respondents, while two respondents experienced rain. One

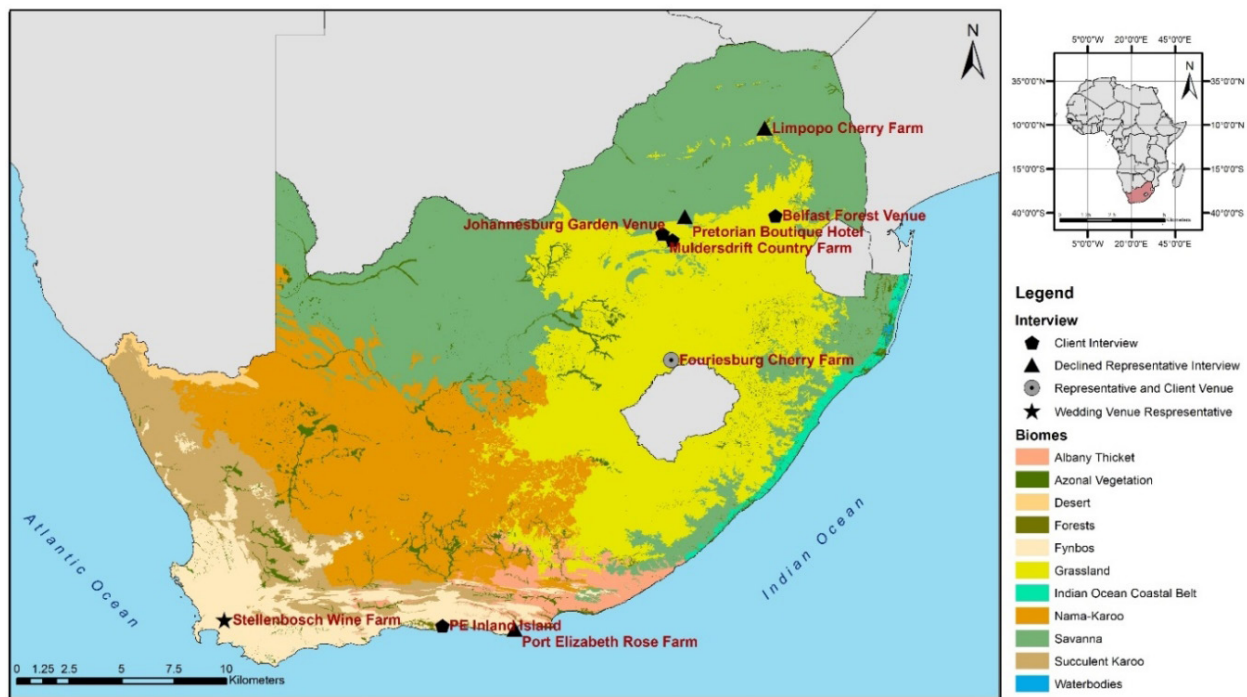


Fig. 1. Map of the wedding venue representatives, client identified venues and non-responsive wedding venues

Table 1. Study sites as identified by client and wedding venue representatives, including their climatic zones and flower species

| Wedding Venue Pseudonym | Location | Biome | Species | Annual Rainfall |
|---|-------------------------------|-----------|---------------------------------|-----------------|
| Client identified Wedding Venue | | | | |
| Belfast Forest Venue | Belfast, Mpumalanga | Grassland | Roses, lavender, summer flowers | 587mm |
| Muldersdrift Country Farm | Muldersdrift, Gauteng | Grassland | Summer flowers | 579mm |
| Johannesburg Garden Venue | Mountain View, Gauteng | Grassland | Summer flowers | 664mm |
| PE Inland Island | Plettenberg Bay, Western Cape | Fynbos | Milkwood forest | 700mm |
| Wedding Venue Representative | | | | |
| Stellenbosch Wine Farm | Stellenbosch, Western Cape | Fynbos | Roses | 673mm |
| Both Client and Wedding Venue Representative | | | | |
| Fouriesburg Cherry Farm | Fouriesburg, Free State | Grassland | Cherry blossoms | 631mm |

respondent referred to the weather on her wedding day as “a perfect summer’s day”.

Respondents indicated that what they considered to be the best date for their wedding largely related to their choice of venue: they would first pick the location and then consider the best date of that

location. Of all the respondents, three had booked their weddings a year or more ahead of time. Availability was a key influence in the booking process. Client F was able to book their wedding six months before their wedding due to a cancellation at the venue. Client B expressed that they were “incred-

Table 2. Wedding venue and wedding date information, including a weather description of said day according to each respondent

| Client | Venue | Location | Wedding date | Weather description |
|--------|---------------------------|-------------------------------|-------------------|--|
| A | Fossil site | Not disclosed | 23 April 2011 | “Clear and the right temperature”, experiences rain later on in the day |
| B | Belfast Forest Venue | Dullstroom, Mpumalanga | 21 April 2018 | Autumn “mild” weather, with cooler “crisp evening[s]” |
| C | Muldersdrift Country Farm | Muldersdrift, Gauteng | 23 January 2016 | “Sunny” weather |
| D | Fouriesburg Cherry Farm | Fouriesburg, Free State | 30 September 2017 | Overcast with thunder: threat of rain, followed by “quick shower” and sunshine |
| E | Johannesburg Garden Venue | Mountain View, Gauteng | 12 December 2017 | Warm “sunny” summer temperatures (29°C): “a perfect summers day” |
| F | PE Inland Island | Plettenberg Bay, Western Cape | 27 February 2010 | “Hot, sunshine” |

ibly lucky with [their] dates” as they faced no issues with booking the date they had chosen. The mobility of guests was also an important factor in choosing a date for two of the respondents. Client E mentioned that the open “holiday” time would suit their international guests for their mid-December wedding date. Furthermore, one respondent mentioned that they chose their wedding specifically to have a weekend celebration in order to accommodate guests schedule and their travel arrangements. Other personal reasons behind booking a particular date were to incorporate birthday celebrations, as described by Client F.

Each respondent revealed distinctive aspects they considered behind the choice of their wedding date. Client B specifically booked an April wedding nine months ahead of time for the “autumn colours” wedding and Client F booked a late February wedding six months ahead of time with hopes of experiencing “generally great” weather. Client A (booked two months ahead) did not mention seasonality. The remaining three clients booked their weddings from one year to 15 months ahead of their wedding day. Of the responses, Client C (booked 15 months in advance) identified summer as the only reason behind their date selection. Similarly, Client E (booked 14 months in advance) stated summer, specifically for the longer days and warmer temperatures. Client D booked a wedding date that would coincide with the blossoming period of the Fouriesburg Cherry Farm’s cherry orchard, as they de-

scribed their chosen wedding date as the “end of [the cherry blossoms] blossoming time”.

Two respondents hoped for warm summer temperatures, while another respondent was hoping for ‘mild’ autumn weather conditions and a “relative[ly] low chance of rain”. Three of the clients expressed that the possibility of experiencing rain was one of the main concerns regarding the wedding date each had chosen. While two clients of these clients did experience rain on their wedding day (Table 2), both emphasised the significance of the sunnier conditions that followed was for their special day, with Client D describing it as a “huge relief”. Client E noted that South African summer weather conditions could be “dicey” or unpredictable regarding rain, “[expecting] either a thundershower or a lovely warm day” for their wedding. The outdoor setting could have been ruined by unpleasant weather conditions and thus, force clients to “move the ceremony indoors”, as expressed by Client D.

When asked about the importance of hosting their wedding in a natural setting, each respondent scored higher than seven on a score out of ten as portrayed in Figure 2. In this regards, a natural setting includes gardens, farms, orchards, forests or any venue with natural or outdoors characteristics.

Each client demonstrated a personal and unique connection to their choice of having a nature-based wedding. One client (Client C) stated they hoped to have a “picturesque” wedding experience. This

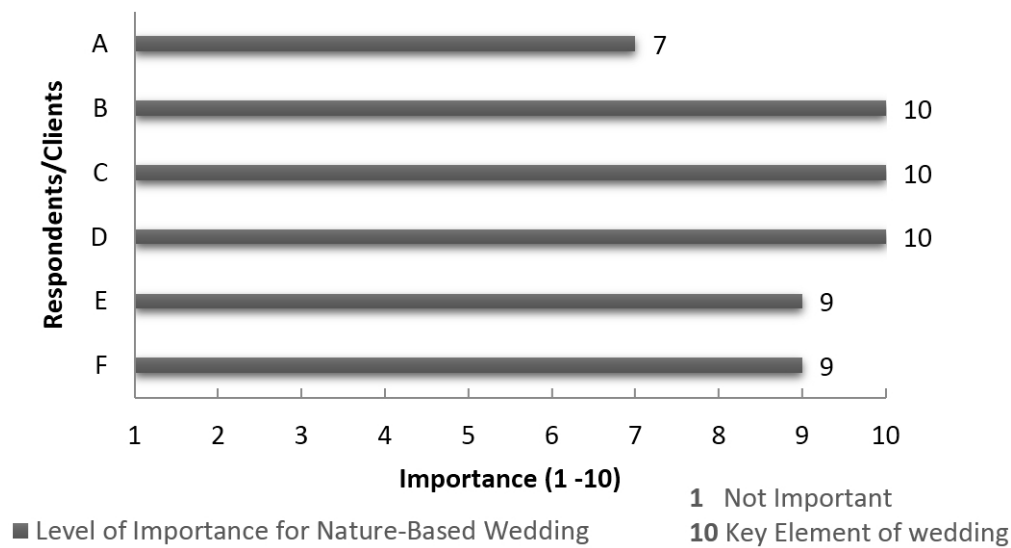


Fig. 2. Results of scores regarding the importance of hosting a nature-based wedding to each client, during the wedding planning process

was labelled as one of the key criteria behind their choice of having a nature-based wedding. However, this incorporation of natural appeal is not only for the visual appeal of nature. For example, nature's aromatic appeal: Client E chose a summer wedding date to have "the smell of flowers in the air" on the day of the wedding.

All the clients expressed a connection to nature through speaking about their emotions towards and their experience of nature. Two clients expressed that the inspiration behind choosing a nature-based wedding was for the "atmosphere" (Client E and F) and the "calmness" (Client F). Client F further expressed their appreciation for experiencing natural settings by stating that they have "a love for outside functions". Couple D states that nature "played a huge role" in their relationship, because they are 'nature lovers and adventurous people', which speaks to their values and experiences. Client B claims that "nature is [a] place that we feel most in touch with our true selves". Couple E states it was "important to [the couple]" that the presence of natural features (i.e. a garden) "soften" the hardness of their urban wedding located in Johannesburg, at the Johannesburg Garden Venue. As mentioned above, Client D specifically booked their wedding date in order to have cherry blossoms in bloom at the Fouriesburg Cherry Farm.

Four of the respondents had consulted with their respective wedding venue representatives regarding the blooming periods of a given plant, flower, gar-

den or orchard. Of those clients, all stated that each of the representatives was able to provide a close prediction of the blooming period of the above-mentioned features. Client D asserts they were informed that the blossoming period of the cherry blossoms would begin during the "first or [the] second week of September" and would "usually [bloom over the following] two to three weeks". However, the client stated that the representative was "careful not to make specific promises" or predictions. Although the blooming period predictions were not discussed, Client E states that the venue representative at the Johannesburg Garden Venue was able to detail which blooming "flowers would be in the garden" at the time of their wedding.

All six respondents state that they were not charged any additional fees to host their weddings in a natural setting, apart from the full standard wedding rate as provided by each wedding venue. Client E, however, mentions that they were charged an additional fee of R5000.00 in order to host their ceremony in the Fouriesburg Cherry Farm's cherry orchard, for 'transportation' (of seats, ceremony equipment and guest) and labour.

Client E was given the alternative option of moving their wedding on site to an "indoors" location at the Belfast Forest Venue, while Client D was given the option of moving her cherry orchard wedding to the venue's main lawn, characterised by the dam and [the Free State - Lesotho border] mountain [range]". Client B and Client E would have pre-

ferred ‘minimalistic glass chapel’ or greenhouse in order to “bring the outside, in”, or an indoors venue with “beautiful architectur[al]” features as an alternative.

In the future, should they host a wedding ceremony again, four clients indicated that they would choose a floral wedding or wedding renewal ceremony, while one would rather opt for a different sort of nature-based wedding (generally - not particularly floral). The remainder (n=1) of the respondents would rather host a wedding “by the ocean”; possibly as a backdrop or on the beach.

Each of the clients was asked to comment on the potential sustainability of floral wedding venues considering the threat of climate change. Their perceptions are not specific to any of the wedding venues identified. Of the respondents, two abstained from engaging with the topic. Of the remaining three respondents, two clearly expressed that neither of them had concerns considering the sustainability of floral wedding venues. However, one of these respondents did not directly comment on the sustainability of floral wedding venues, but on future wedding aesthetics and venues, in a general sense. This respondent believes a technocentric approach to future climate change threat would be the most successful approach to sustainability: “our society is innovative enough to come up with a sustainable and equally attractive alternative”.

Another respondent expresses that their main concern is the commodification of nature, “flowers and outdoor spaces are becoming a commodity”, as a result of present climate change threats or rather, extreme environmental hazards, such as “the droughts [South Africa has] experienced” in recent years. This client concluded by emphasising that proper management of a venue’s business could aid in mitigating possible environmental risks.

3.2. Wedding Venues’ Perspectives

Five wedding venues were contacted: a Stellenbosch Wine Farm, Port Elizabeth Rose Farm, Limpopo Cherry Farm, a Pretorian Boutique Hotel and Fouriesburg Cherry Farm. A representative from the Stellenbosch Wine Farm and the Fouriesburg Cherry Farm were the only to proceed with an interview.

Each of the wedding venues identified by the clients have online profiles which list information regarding their offerings. Each provides their venue for hosting weddings, serving staff and catering options. The wedding packages of these wedding venues differ in terms of what is included. However, all wedding venues have peak and low peak rates for summer weddings as compared to winter weddings. Four wedding venues offer both ‘on the day’ or ‘weekend long’ wedding services, thus facilitating wedding tourism. One venue only provided a full weekend experience due to its location. All of the wedding venues provide accommodation options, on-site transportation (if needed), a wedding coordinator, and décor as a standard package, with certain venues providing more all-inclusive packages at their standard rate.

Both of the interviewed respondents share the sentiment regarding the value of their natural environments. Similarly, both representatives labelled the view of their respective mountain range as an advantage to clients hosting their weddings at their venue. The representative from the Fouriesburg Cherry Farm romantically described the venue as a “little piece of heaven”. The Stellenbosch Wine Farm’s representative stressed that they believe that clients choose to host their weddings in either of their rose gardens more for the “beautiful view around them” rather than the presence of flowers (roses) at the venue.

In the case of the Stellenbosch Wine Farm, the representative conveyed that the role that the roses played in weddings hosted at either of their rose gardens were not large, as their popular venue for the ceremony and reception was rather their main banquet hall. This is attributed to the beautiful built environment (historical colonial buildings), carrying capacity and access to service infrastructure (i.e. kitchen area as opposed to the picnic catering at of the venue’s rose gardens). With regards to both of their rose gardens, the representative believes that the view of the mountains outweighs the floral element of the wedding venue. By this, they stated that they believe that clients do not “based their weddings” on the possibilities of having roses blooming on their wedding day as roses are “just a feature”.

By contrast, the Fouriesburg Cherry Farm’s representative shared that clients prioritise the presence of flowers at a wedding venue, stating that clients

often show a deep interest in hosting their wedding ceremonies in the venue's cherry orchard specifically when the cherry blossoms are in bloom. They mentioned that clients often book their wedding date a few years in advance to take advantage of this opportunity. When asked about the predictability of the annual date of the blossoming of the cherry blossoms, the representative stated "the first week of September". However, they were wary of providing a particular date by stating that they "can't [say] whether [flowering] is going to happen on the 6th or the 16th, or when [flowering] is going to happen".

The representative mentioned that the cherry blooming season is only over a short amount of time usually during the month of September and thus, they moved to focus on the "beautiful" natural environment surrounding the venue, making note of the surrounding Wittberg Mountain and the two dams on site. Clients are able to host their ceremonies in the cherry orchard regardless of whether or not the blossoms are in bloom or not. The cherry orchard is located at the base of a mountain and thus, the venues are described as "amazing".

There is little evidence of policy implementation regarding the future threat of climate change and its impact on the plant environment from either representative throughout the interviews. The interview with the Stellenbosch Wine Farm's representative was terminated without any perceptions or thoughts shared on the topic, as flowers were not a key feature for the venue. The Fouriesburg Cherry Farm's representative provided their thoughts and opinions on the matter. When asked if the venue has any concerns about climate change, the representative responded readily, further stating that "*everyone ... worries about climate change*". This representative mentioned phenomena, such as the recent southern African drought of 2017/18, the imminent extinction of honey bees and temperature and precipitation variations. The respondent expressed their belief that climate change "plays a huge role" in agriculture and that farming in this context, is a far more complex process. The representative further shared that the venue had only harvested five tons of cherries in 2017, as opposed to the average 80 tons of cherries. Thus, the representative recognised that the effects of climate change are evident in their present reality and that they are not only isolated to the future.

4. Discussion

Weddings, in themselves, "have an emotional effect that eludes description" (Mupotsa, 2014, 9), where they possess a *specialness* which is connected to "meanings of personhood, belonging [and] social change" (Mupotsa, 2015, 10). In another sense, weddings are various forms of business and tourism (Bertella, 2017). The relationship the wedding industry shares with the natural environment is dependent on a variety of reasons. Due to the emotional significance of weddings, there are push factors behind clients choosing a certain type of wedding. Clients of nature-based weddings displayed particular connections to nature and the outdoors. Each of the clients attributed a particular reason behind choosing to have a nature-based wedding. However, this is not only the work of client preferences, but this is dually credited to the marketing mechanisms and strategies companies, destinations and wedding planners use in order to pull clients to their destination (Seebaluck et al., 2014; Bertella, 2017).

Wedding tourism is an emerging global industry. In South Africa; the local wedding industry relies on natural environments for hosting weddings, for photographic purposes (Rogerson, Wolfaardt, 2015). This is based on the fact that clients wish to have wedding days which are "idyllic", "picturesque", "unique" and perfect (Rogerson, Wolfaardt, 2015, 3) which are more easily associated with natural elements as opposed to features of urban landscapes. Wedding tourism has been described to have great "economic (direct, indirect and induced), social, environmental and marketing impacts and benefits" (Del Chiappa, Fortezza, 2013, 412). Nature-based weddings, in particular, are seen as significant due to the romanticised ideas of what nature is or provides: either a "little piece of heaven"; a place where one "can truly be themselves"; a place of "peace and tranquillity" (Rogerson, Wolfaardt, 2015, 3) or an escape for the mundanity and mediocrity of everyday life (Seebaluck et al., 2015; Etamaddar et al., 2018). Additionally, clients of this study relate to natural environments on a personal and emotional level as they attribute certain personal experiences to nature, and they ascribe certain means to the role that nature plays in their lives and their relationships.

Considering that four of the six clients interviewed in this study stated that they would look towards hosting their weddings or vow renewals in natural settings in the future, it is necessary to consider whether this client preference for nature-based weddings has been a persistent trend in or if it is an emerging trend. Furthermore, in considering the sustainability of this sector, it is important to consider whether this (nature-based wedding) trend is either set to escalate or be transgressed by an alternative wedding trend in the future. A number of countries and cities around the world are continuously exploring and investing in their wedding destination capabilities (Durinec, 2013; Seebaluck et al., 2014; Vidauskaite, 2015; Marais et al., 2017). Cities, countries and regions synthesise nature tourism with their wedding tourism industry (Rogerson, Wolfaardt, 2015), i.e. Italy (Bertella 2017); Greece (Khodzhaeva, 2016), Mauritius (Seebaluck et al., 2015), the Caribbean (Vidauskaite 2015). These locations are popular honeymoon destinations (Khodzhaeva, 2016), and are now looking to diversify their market by incorporating wedding tourism, while using their lucrative natural appeal, which may include beaches, warmer temperatures, mountain ranges, and lush biodiversity (Khodzhaeva, 2016).

Of those who stand to receive the most benefits are wedding destinations, through growing branding; the use of local identity and culture and the through promotional events and exhibitions (Durinec, 2013; Vidauskaite, 2015). Durinec (2013) mentions that the importance of a wedding day to a couple, as money is no expense for “the day of their dreams” (pg. 2), holds potential financial gains for wedding venues which provide such wedding experiences. Branding is the practice of establishing “a distinguishing name and/or symbol (such as a logo, trademark, or package design) intended to identify the goods and services of either one seller or a group of sellers” (Aaker, 1991, 7 in Vidauskaite, 2015, 6). Each of the wedding venues apart of this study embrace the natural aesthetic appeal of their surrounding environments and mentioned above (e.g. Figure 6.3.), while one wedding venue (Pretorian Boutique Hotel) mentioned blooming gardens as a legitimate element of their wedding service to clients.

4.1. Future Outlook

The natural environment is a fundamental component of all weddings due to the significance of flowers, and the preference for outdoor ceremonies in picturesque environments. Thus, the threats of climate change to the natural environment and flowering poses an immense threat to the sustainability of this sector (Lui et al., 2018). It is important for wedding venues and wedding tourism businesses to be able to predict the dates and periods of the flowers on which they rely, which Zhengong et al. (2008) term “flowering date forecasting” (Zhengong et al., 2008, 5210), to provide reasonable assurance to their prospective clients of the setting or flowers they have booked for (Rogerson, Wolfaardt, 2015).

Nine wedding venues were identified in this study and of those; two had a distinct relationship with a particular flower species. The Fouriesburg Cherry Farm and The Limpopo Cherry Gardens are characterised by the presence of cherry blossoms on their venue (Table 3) and have been identified as a key feature of each wedding venue. Therefore, the potential phenological change of cherry blossoms in global and localised literature is assessed in order to predict global rates of change in the flowering dates for the cherry blossom flowers distinct to these two wedding venues. The remaining wedding venues were not distinctly connected to a particular flower or plant species. However, these venues were characterised by seasonal flowers and plants and thus, a meta-analysis of seasonal rates of phenological change will be considered with mentions to specific plants identified through images at the wedding venues.

Global temperatures have increased by 0.6 °C over the past century (Root et al., 2003). Between the years 1880 to 2012, these temperatures have increased by 0.85 °C, or at a continuous rate of 0.2 °C per decade as recorded by Hensen (2006, in Cleland et al., 2006; Wang et al., 2017). Additive to precipitation and solar radiation, temperature plays a highly influential on phenological shift; when spring temperatures are needed for the spring blooming and winter chill for dormancy breaking for fruit trees (Zhengong et al., 2008; Li et al., 2016). Localised micro-climatic phenomena, such as the Urban Heat Island, heighten the phenological shifts of

Table 3. Summary of the phenological shift rates of change for species and locations in this study

| Species | Paper | Rate of Advance (day/ decade) | Place |
|------------------------------|------------------------------|----------------------------------|---------------------|
| Cherry blossoms | Miller-Rushing et al. (2007) | 2.2 | Tokyo (Mount Takao) |
| | Wang et al. (2017) | 3.73 - 4.75 | Beijing, China |
| Seasonal Flowers | | | |
| All plants | Parmesan, Yohe (2003) | 2.3 | Northern Hemisphere |
| All plants | Root et al. (2003) | 2.8 | Northern Hemisphere |
| South African flowers | | | |
| Golden Delicious Apple | Grab, Craparo (2011) | 4.2 | Western Cape |
| Granny Smith Apple | | 2.4 | |
| Jacarandas | Fitchett, Fani (2018) | 2.38 | Gauteng |

urban flora (Zhenghong et al., 2008). Urban areas have been recorded to have stronger shifts, which result in flowering up to 2-4 days earlier than rural areas (Parmesan, 2006). Many of the species of interest to this study have not yet been explored with regards to the phenological shifts over recent decades in South Africa. Interpolation must therefore be made for the same species in another country, or different species within South Africa (Table 3). This is not the most accurate projection of the impact of climate change on the South African wedding florals, as phenological shifts are highly location and species specific (Fitchett et al., 2015), but provides a working estimate. The phenological shifts are likely to be in the range of 2-4 days per decade (Table 3). This appears relatively slow, as it would take a minimum of 75 years for mean flowering dates to have changed by a month. However, coupled with these mean shifts in flowering dates is an increase in the interannual variability of phenological events, which makes the prediction of the flowering season for the following year increasingly less accurate.

Alam et al. (2017) determine that the perceptions of communities, who inhabit certain locations, of how climate change is evident in their local realities are important in planning and implementing mitigation/adaptive strategies. As the Fouriesburg Cherry Farm's representative shared, their 2017 cherry fruit yield quantity at the orchard, this could be connected to the representative's forthcoming engagement with the topic. This could be attributed to the notion that communities which have first-hand accounts of climatic change and its effects have formed more of an opinion on the matter (Alam et

al., 2017). Furthermore, the importance of community and venue owner involvement is based on the need for stakeholder engagement in these planning and implementing mitigation/adaptive strategies, in order to consider an array of aspects to provide comprehensive, efficient and adequate sustainability, environmental and social solutions (Wyss et al., 2014; Hingtgen et al., 2015; Elum et al., 2017; Harrera et al., 2018).

Harrera et al. (2018) state that it is important to understand the implications of climate change on tourism and destination demand, as these implications could cause an incremental decrease in demand as dissatisfaction rises, due to the discretionary nature of tourism. An absence of climate change considerations could lead to a total unpreparedness of preventative and mitigation measures and management of these natural spaces (Elum et al., 2017). The ability to adapt to climate change is the ability for "human-environment systems [to respond] to actual and/or anticipated different climatic conditions" (Alam et al., 2017: 53) aiming to mitigate the potential and evident risk, while recognising the opportunities under a different environmental framework (Wyss et al., 2014; Elum et al., 2017). Some reasons attributed to the inability to be adaptive are due to the magnitude of the impact, agro-ecological systems, capability (infrastructure and means) and socio-economic realities (Alam et al., 2017). Table 4 reflects the list of wedding venues in South Africa which as of June 2019 either mention or contain photographs of flowers on their website. Each of these should pay careful

Table 4. List of Wedding Venues in South Africa which include florals in their written and/or visual online advertising

| Wedding venue | Province | Town | Flowers Mentioned | Flowers Visible |
|---------------------------------------|---------------|-------------------------|-------------------|-----------------|
| African Vineyard | Northern Cape | Keimoes | YES - G | YES |
| Bezalel Estate Venue | Northern Cape | Keimoes | YES - V | NO |
| D.Wingerskuur | Northern Cape | Uptington | YES - G | YES |
| Die Ou Huie | Northern Cape | Uptington | NO | YES |
| Casa Mila | Northern Cape | Douglas | NO | YES |
| Broadwater River Estate | Northern Cape | Douglas | NO | YES |
| Bella Cardi Wedding Venue | Northern Cape | Kimberly | NO | YES |
| The Retreat Wedding and Events Venue | Northern Cape | Kimberly | NO | YES |
| The Venue | Northern Cape | Pampierstad | NO | YES |
| Die Kasteel Hartswater Wedding Venue | Northern Cape | Pampierstad | NO | YES |
| Milorho Lodge and Wedding Venue | North West | Rietfontein | NO - ORC | YES |
| Leopard Lodge Hartebeespoort | North West | Hartebeespoort | NO | YES |
| Green Leaves Wedding Conferences | North West | Hartebeespoort | YES - G | NO |
| Red Ivory | North West | Hartebeespoort | NO | YES |
| Die Wildevy Wedding Venue | North West | Hartebeespoort | YES | YES |
| Camelotte Wedding Venue | North West | Hartebeespoort | YES - G | YES |
| Zakopane Country Village | North West | Brits | YES | YES |
| Arotin Game Lodge | North West | Brits | YES - G | NO |
| Welgemeend Cape Town | Western Cape | Cape Town | YES - G | NO |
| Suikerbossie Restaurant and Estate | Western Cape | Hout Bay | YES - G | YES |
| Marlenique Estates | Western Cape | Paarl | YES - ORC/V | YES |
| Nooitgedacht Estate | Western Cape | Stellenbosch | YES - G | YES |
| Hudson's Wedding Venue and Restaurant | Western Cape | Stellenbosch | YES | YES |
| Silnust Wine Estate | Western Cape | Stellenbosch | NO | YES |
| Boschendel Wine Estate | Western Cape | Stellenbosch | YES | YES |
| Cavalli Estate | Western Cape | Somerset West | YES - G | YES |
| Laurent at Lourensford | Western Cape | Somerset West | YES - G/V | YES |
| Bakenhof Wedding Venue | Western Cape | Wellington | YES - V | NO |
| Zonnevanger | Western Cape | Northern Paarl | YES | YES |
| Nantes Estate | Western Cape | Wellington | YES - G | YES |
| Leeuwrvier | Western Cape | Wellington | YES - G | NO |
| Ashanti Estate | Western Cape | Paarl | YES - G | NO |
| Inniebos Wedding Venue | Eastern Cape | Kareedow | YES - FOR | YES |
| The Wood Venue | Eastern Cape | Humansforp | NO | YES |
| The Rose Barn | Eastern Cape | Jeffery's Bay | YES | YES |
| Thatchwoods | Eastern Cape | Port Elizabeth | YES - G | NO |
| La Cigale Exclusive Country Estate | Eastern Cape | Port Elizabeth | YES - G | YES |
| Swanlakes Gardens | Eastern Cape | Port Elizabeth | YES - G | NO |
| The Estate Deo Volente | Eastern Cape | Chelsea, Port Elizabeth | NO | YES |
| The Boma | Eastern Cape | Port Elizabeth | YES - F | NO |
| The Plantaion | Eastern Cape | Port Elizabeth | YES - G | NO |
| Arabest Weddings and Functions | Eastern Cape | Despatch | NO | YES |
| Plumbago Hills | Eastern Cape | Uitenhage | NO | YES |
| Eden Lassie | KwaZulu-Natal | Hopewell | YES | YES |
| The Venue Fontana | KwaZulu-Natal | Outer West Durban | YES - G | YES |

Table 4. Continue

| | | | | |
|--------------------------------------|---------------|--------------------|------------|-----|
| Macnut Farm | KwaZulu-Natal | Outer West Durban | YES - G | NO |
| Bake Manor, Kloof | KwaZulu-Natal | Kloof | YES | YES |
| The duBoirs Boutique Lodge | KwaZulu-Natal | Waterfall | YES - G | NO |
| Willowvale Weddings | KwaZulu-Natal | Mooi River | YES | YES |
| Providence Country Estate | KwaZulu-Natal | Nottingham Road | YES - G | YES |
| Bellwood Cotages | KwaZulu-Natal | Nottingham Road | YES - FOR | NO |
| The Zunguness | KwaZulu-Natal | Curry's Post | YES | YES |
| The Glades Farm | KwaZulu-Natal | Curry's Post | YES - G | YES |
| Orchards Wedding Venue and B&B | KwaZulu-Natal | Lidgetton West | YES | YES |
| Cranford Country Lodge | KwaZulu-Natal | Howick | YES - G | YES |
| Haycroft Farm | KwaZulu-Natal | Howick | NO | YES |
| Collishen Estate | KwaZulu-Natal | Dolphin Coast | YES - G | YES |
| Maroupi Wedding Venue | KwaZulu-Natal | Dolphin Coast | YES- G/FAR | NO |
| Kearsney Manor | KwaZulu-Natal | Msonono | YES - G | NO |
| Pepper Tree Venue and Guest House | Free State | Bloemfontein | YES | YES |
| Welglegen Cherry Estate | Free State | Fouriesburg | YES | YES |
| Wynford Holiday Farm | Free State | Fouriesburg | YES | YES |
| Bella Montana | Free State | Fouriesburg | NO | YES |
| Andes Clarens | Free State | Bethlehem | YES - G | YES |
| Lekoa Lodge | Free State | Villiers | YES - G | YES |
| Phirimane Wedding Venue | Free State | Vredefort | NO | YES |
| The Nutcracker Country Venue | Free State | Vredefort | YES - ORC | NO |
| Kiepersol Wedding Village | Free State | parys | YES - G | NO |
| Hidden Grace | Free State | Parys | YES - G | YES |
| La Petite Salle | Free State | Parys | NO | YES |
| Vintage Yard Wedding Venue | Free State | Parys | YES - V | NO |
| Pont de Val Estates | Free State | Parys | YES | YES |
| Sun Valley Wedding and Golf Venue | Gauteng | Eikenhof | YES - G | YES |
| Jasmine Hills Country Venue | Gauteng | Eikenhof | YES - G | YES |
| Thornbirds | Gauteng | Johannesburg South | YES - G | YES |
| The View Wedding and Event Venue | Gauteng | Johannesburg South | NO | YES |
| Heavensgate | Gauteng | Boksburg | YES - G | YES |
| Shepstone Gardens | Gauteng | Johannesburg | YES | YES |
| Image Lifestyle Venue | Gauteng | Johannesburg | YES - G | NO |
| Morrells Boutique Estate | Gauteng | Randburg | NO | YES |
| Memoire wedding and Function Venue | Gauteng | Krugersdorp | YES - G | NO |
| Oakfield Farm | Gauteng | Muldersdrift | YES | YES |
| Everwood Country Weddings | Gauteng | Muldersdrift | YES | YES |
| Motozi Lodge | Gauteng | Hartbeespoort | YES - G | NO |
| Amorosa Wedding and Conference Venue | Gauteng | Vontina | YES - G | YES |
| La'Mathil Wedding Village | Gauteng | Pretoria | YES - G | YES |
| Duck and Dine | Gauteng | Akasia | YES - G | YES |
| Avenue on Iris | Gauteng | Akasia | YES - G | NO |
| De Harte Venue | Gauteng | Onderspoort | NO | YES |
| Morgenzon Estate | Gauteng | Pretoria West | YES - G | YES |
| Bushloerie Function Venue | Gauteng | Haakdoornboom | YES - G | NO |
| Bukra Manana Function Venue | Gauteng | Pretoria | YES - G | NO |

Table 4. Continue

| | | | | |
|---------------------------------------|------------|---------------|-------------|-----|
| Zambesi Lodge | Gauteng | Zambezi | YES - G | YES |
| Grace Falls | Gauteng | Pretoria | YES - G/FOR | NO |
| Zambezi Point | Gauteng | Pretoria | YES - G | NO |
| Diep in die Berg | Gauteng | Pretoria | YES - G | NO |
| Monte de Dios | Gauteng | Pretoria | NO | YES |
| Ever Be | Gauteng | Pretoria | NO | YES |
| Grassland | Mpumalanga | Bethal | YES - G | YES |
| Florence Guest Farm and Wedding Venue | Mpumalanga | Chrissiesmeer | YES - FOR | NO |
| Perdekraal Wedding Venue | Mpumalanga | Ermelo | YES - G | NO |
| The Corn and Cob | Mpumalanga | Middleburg | YES - G | YES |
| Cabbage and Rose Country Venue | Mpumalanga | Middleburg | NO | YES |
| The Silver Sixpence | Mpumalanga | Dullstroom | YES - FOR | YES |
| The Red Barn | Mpumalanga | Dullstroom | NO | YES |
| The Hot House Venue | Mpumalanga | Dullstroom | YES | NO |
| Umbali | Mpumalanga | Nelspruit | YES - G | NO |
| Whispering Thorns | Mpumalanga | Nelspruit | NO | YES |
| Ashante Bushveld Lodge and Venue | Limpopo | Lephalale | YES - G | NO |
| Casamento Lodge | Limpopo | Modimolle | YES - G | YES |
| Monate Game Lodge | Limpopo | Modimolle | YES - G | NO |
| Hayani Guest House | Limpopo | Polokwane | YES - G | YES |
| Makarios Lodge | Limpopo | Polokwane | YES - G | NO |
| Grin Court Nature Reserve | Limpopo | Polokwane | NO | YES |
| MonCherie Wedding Venue | Limpopo | Dendron | YES - G | YES |
| Cheerio Gardens | Limpopo | Haenersburg | YES | YES |
| Tzaneen Country Lodge | Limpopo | Tzaneen | YES - G | YES |
| Bordeaux Game Farm | Limpopo | Marnitz | NO | YES |

G - Mentioned Gardens, V - Venue is a/part Vineyard, **FOR** - Mentioned Forest, **FAR** - Venue is a/part Farm (fauna), **ORC** - Venue is a/part Orchard

attention to the threats of climate change to their destination image.

Nonetheless, non-response was recorded in this study. Each of the representatives were informed of the climate change orientated focus of the study and the fact that their wedding venue was a point of interest due to the floral/natural aspect of their venue. Having considered the risk, the majority of the participants appeared to display only minor concern over climate change. This echoes the findings of Pandy and Rogerson (2019) in the case of urban tourism in Johannesburg. It would appear that wedding venues pay greater attention to immediate business, rather than the future (or current) threats to the sustainability of their businesses. Furthermore, it is essential to be concerned about possible climate change effects in relation to different elements of nature and not isolate concern to pri-

oritisied elements as according to either clients or wedding venues.

5. Conclusion

All stakeholders of floral weddings require a deepened awareness and concern of climate change threats in order to ensure the sustainability of this emerging sector. Shifting phenology is one of the most sensitive and immediate responses to climate change and without the ability to respond, businesses within this sector stand to hinder their ability to be service providers to future clientele. The aim of this study was to gauge the extent to which shifting phenology poses a threat to the sustainability of wedding venues that rely on flowers as one of the

main attractions of their wedding experience. In order to achieve this, key informant interviews were used as a tool of gathering client and venue representative perceptions of climate change. In result, it appeared that respondents who either had beliefs in possible solutions or had experienced the effects of climate change first-hand, engaged with the topic. Phenological change through global and local literature were used in order to predict the future phenophases present at each wedding venue identified in this study, for the years 2050, 2075 and 2100. The predicted forecasts show drastic shifts in the timing of phenophases and furthermore, the continuous rise in temperatures not only shifts the phenophases of species but threatens the existence of certain taxa which are not able to adapt in lower (frost) and higher (warming) temperature zones. Thus, floral wedding venues are at risk of jeopardising their sustainability as the overall sustainability of biodiversity could fall victim to the threat of climate change. It is thus important for wedding venues to implement adaptive strategies and mitigation initiatives in order to protect and sustain their businesses and their surrounding environment at large.

Acknowledgments

We thank the two anonymous reviewers for their insightful comments and helpful suggestions, which have aided us in improving this manuscript. We thank ASF for editorial assistance.

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