

Sustainable Project Management Necessarily Implemented In The Chinese Wine Market Due To Climate Variation

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ABSTRACT—Nowadays, sustainable project management has become an inevitable trend globally. Since Sustainability and globalization are the main focus and trends in the 21st century, project management contains system-based optimization, and organizational humanities, environmental protection, and economic development. As a populous country globally, with the advanced development of economy and technology, China becomes one of the biggest markets in the wine industry. However, the development of society also brings specific environmental issues. Climate changes have already brought severe impacts on the Chinese wine market, including consumer behavior, wine production activities, and organizational humanities. Therefore, the implementation of sustainable project management in the Chinese wine market is essential. Surveys based analysis is the primary method to interpret how the climate variation effect the Chinese wine market and the importance of sustainable project management implementation for green market growth in China. This paper proposes the CWW (Consumer Behaviour, Wine Production, Wine Companies) Conceptual model that can be used in the wine industry, the new 7 Drivers Model, and SPM(Sustainable Project Management Implementation) Framework to interpret the main drivers that impact project management implementation in the wine industry and to offer directions to wine companies in China which would help them to achieve green growth.

Keywords—Climate changes, Chinese wine market, Green growth, project management, Sustainability

I. INTRODUCTION

With the development of globalization, social and economic rapid developing, Chinese market becomes one of the largest markets in the wine industry worldwide. In 2019, the Chinese population consumed approximately 1.78 billion liters of wine, making China the fifth leading wine consumer worldwide [1]. However, social and environmental issues have emerged at the same time, especially climate change [2], which has a significant impact on the Chinese wine market. Consumer behaviors have been influenced due to climate change. There is a CWW model we designed for interpreting the relationship of consumer behaviors, wine production and wine companies which are the three main factors in the wine marketing area in China.

Since Sustainability is becoming the main force in the 21st century, sustainable project management is paying a more and more important role for project managers. Using the benefits of sustainable project management in the Chinese wine market will generate more value and improve green growth. Due to the fast expansion of the Chinese wine market, companies have to face kinds of problems, especially in small-medium size, project managers have to be conscious of implementing sustainable project management in order to boost green growth for companies. Furthermore, Sustainability should be one of the goals pursued by wine companies, project management should not simply base on system optimization and pure pursuit of sales growth. What's more, project managers must know how to implement sustainable project management in an efficient way, especially when they are in a problematic environment, even in the current epidemic situation. Therefore, the paper will present the solutions on how sustainable project management will be implicated to bring green growth to the Chinese wine market while adapting to climate change. We propose the new model of 7 main drivers which intimately effect sustainable project management implementation and SPM Framework to elaborate the process of implementation as well.

I. RELATED WORK

Nowadays, many works focus on the impact of climate change on the wine industry. Due to global temperature rise, "global warming" is a frequent phenomenon [3].

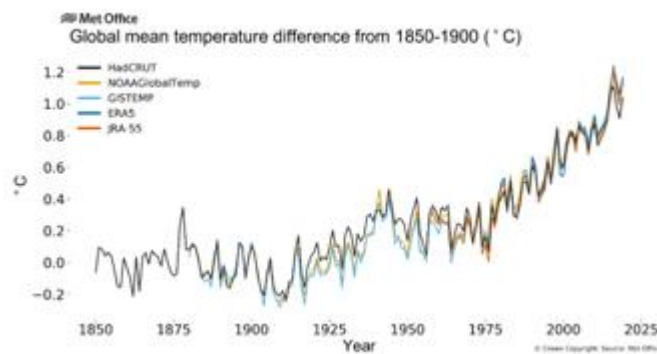


Fig. 1. Global mean temperature difference from 1850-1990. Source Met Office

We can obviously note that, in Fig.1., the past five years (2015-2019) have been the warmest five years according to the complete meteorological observation records, since the 1980s, each successive decade has been warmer than the previous decade [4].

Although every government has continuously reminded people to pay attention to environmental issues, the trend of global warming is still visibly deteriorated [5]. Michelle Renée Mozell and Liz Thach stated the global warming has a vital impact on both vineyards and winemaking process, but still there are plenty of wineries in the world that have taken steps to find out solutions to climate issues, sustainable and environmentally practices are becoming more effective [6]. The influence of climate variables become remarkable during the wine making and the wine storage period [7]. Therefore, wineries will have to face the consequence of climate change on the viticulture and consider the sustainable development of the winery [8,9]. Not just has impacts on viticulture and wine production, climate modification influences the wine business as well [10]. Viticulture is very sensitive to the climate, so as “terroir”, the soul of the wine, which includes the environment and moisture will have crucial effect on wine quality that directly affects consumers’ satisfactions with the taste of wine [11]. As a one of the biggest wine markets with great potential globally, the mid to high-income class population in China was about 112 million in 2019, and almost half of them were having imported wine at least twice a year [12]. Pierre Pradier explained that the consumer behaviors are different between the north and south China because of the temperature distinct [13], for instance, the people from south of China prefer fresh and fruity white wines since the local temperatures are very high. Therefore, climate indeed will give a significant impact on consumer behaviors in the wine market.

With the climate changes continuously, if China would like to maintain a favorable position in the wine market, the implementation of sustainable project management is particularly important. In recent years, more and more studies related to Sustainability have been carried out in different areas. Alessandro Orsi interpreted the LEAN Approach which contributes to the development of green-building project management [14]. People nowadays in the industry prefer to focus on high-performance projects, minimize waste, maximize value, and reduce cost [15]. The BREEAM Protocol plays a key role in cost control in sustainable building design at the international level. Passive House which was established in 1996, makes a tremendous contribution to energy savings in project [16]. And for organizations, sustainable project management covers the product, process, people, planet (environmental), and prosperity (economic) impacts (P5 Standards) [17]. Although the culture and personal technical knowledge make differences in perception and understand of Sustainability [18], sustainable project management is becoming very important which requires pay more attention on economic, social, and environmental aspects. Projects issues are not just system or information lag, but also related to organizational culture variables [19]. Sustainability will help companies for value creation [20]. Organizations should improve the competitive advantage through hiring high-tech talent employees and finding out the best methods for controlling resource, along with utilizing lower-cost resources to save costs [21].

In this paper, we aim to find out the relations in three factors in the Chinese wine market that consumer behaviors, wine production and wine companies. Under the climate modification, these three factors interact with each other, many issues are appearing in the Chinese wine market, especially wine companies, the lack of marketing understanding, the ineffective use of resources, outdated management model bring a lot of difficulties to companies. It is time for these companies will need to change to sustainable project management.

Face to the challenges, we use both surveys and interviews to analyze how the climate impacts consumer behaviors and how significant Sustainability is in the Chinese wine market. We also design the new sustainable project management model for organizations in order to help companies achieve green growth in wine area.

II. CWW CONCEPTUAL MODEL.

To achieve the research goal of identifying the correlation between wine consumer behavior and climate changes, and the importance of sustainable project management implementation in the Chinese wine market, the research design merges interview and the survey-based data collection.

As we mentioned in the literature review, there are three main factors under climate variable interact with each other in the wine industry, which are consumer behaviors, wine production and wine companies (wine distributors/importers). Fig. 2 shows the CWW model we designed. Changes in any one of these three main factors will affect the other two variables. For instance, climate changes impact consumer behaviors, if people’s preference is changing, wineries have to produce the wine which according to people’s preferences and satisfaction if the winery would like to have a great market share in China. On the other hand, climate leads to the direct influence on “Terroir”, in which the wines flavor would be changed, it brings the risk on both pricing and consumers’ satisfactions.

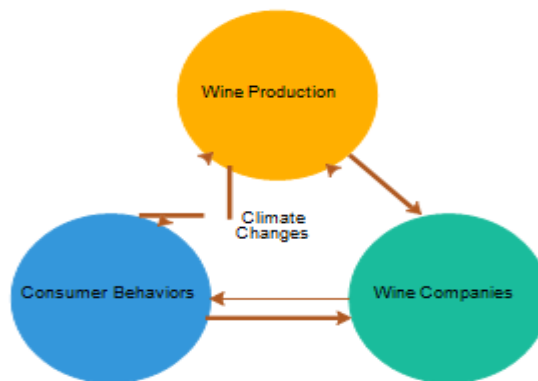


Fig. 2. CWW Conceptual model in the wine industry

There is no doubt that climate changes also impact wine companies(distributor/importer). As the environmental issues have become a topic of global concern, and Chinese wine companies are mostly small and medium-sized, along with the inefficiency management, lack of marketing understanding, and the waste of resources which cause several negative consequences. The paper will focus on the two factors – consumer behaviors and wine companies as Fig.3 presents. We will use the data retrieved from the interview of wine companies’ managers, in order to conclude a clear relationship between the market and companies, the consumer behaviors, and companies’ strategy. It is imminent for companies to use sustainable project management to solve the problems while they are dealing with. Additionally, we will use survey- based data analysis to prove how the climate affects consumerbehaviors.

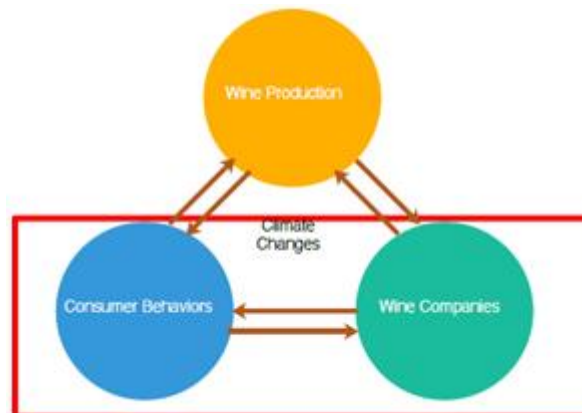


Fig. 3. The image shows the paper focuses on the two factors of CWW Conceptual model that are Consumer Behaviors and Wine Companies

A. Correlation between wine consumer behavior and climate changes in the Chinese wine market.

Climate changes brought several significant impacts on the wine industry especially in viticulture and wine production [22]. However, only a few studies mentioned the relationship between climate changes and consumer behaviors. According to CWW Conceptual model, consumer behaviors have a direct influence on both wine companies and wine production (wineries). Therefore, the correlation between climate changes and

consumer behavior has become particularly crucial, because the change of this variable straightly affects the other two variables.

We have made the survey and had feedback from 303 people. All of them are from different regions in mainland China. The survey was placed on the major social platform, and people can freely choose whether they want to participate or not. The Fig. 4 displays 303 samples, male accounts for 44.22%, and the other 55.78% are female. People age from 18 to 30 are more interested in wine and they occupied a great percentage of the total participant pools.

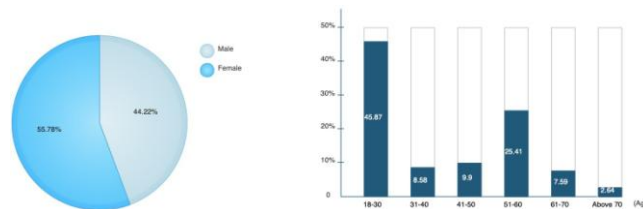


Fig. 4. Gender percentage and age group

We used SPSS to analyze the data's Reliability from survey in the Table 1. Cronbach $\alpha > 0.7$ and CITC values of the analysis items are all greater than 0.4, which concludes that there is a positive correlation between the analysis items, and the reliability level is good [23]. It comprehensively demonstrates that data reliability is of high quality and can be used for further analysis

Due to Chinese culture, people still like Baijiu, especially in the male groups. However, it is not hard to conclude that young people (age from 18-30) become the main wine consumption group in the Chinese wine market. And the red wines which have a medium alcohol level (10%-12%) are the most popular wine for Chinese people as Fig. 5 displays.

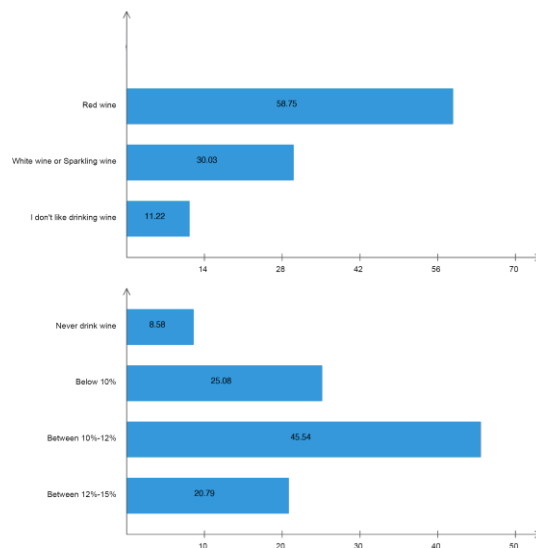


Fig. 5. People's preference on wine type and wine alcohol level.

Different from our original prediction that people would choose the wine style according to the temperature level. However, in our samples, only about one-third of people (36.63%) will choose different types of wine based on temperature.

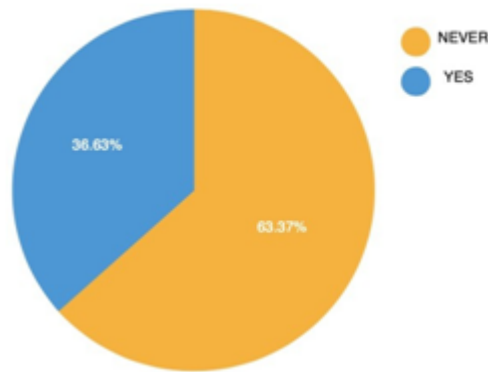


Fig. 6. People choose different wines according to the temperature.

However, people who like a good vintage is occupied for 56.44%. As Fig. 7 presents, even though most of the participants have few pieces of knowledge about wine.

We analyze the Pearson of four records by using SPSS. The people’s wine knowledge and people’s working related to

TABLE I RELIABILITY OF DATA.

Item	CITC	ρ	Cronbach ρ
What level of alcohol do you prefer?	0.515	0.732	0.764
When you are choosing a wine, do you like a good vintage?	0.480	0.742	
Do you think "terroir" is very important to the taste of wine?	0.535	0.729	
Do you think, the Chinese wine market sustainable development is very necessary?	0.489	0.737	
How often do you drink wine?	0.633	0.724	
Would you like to choose different wines according to the temperature? For example: In a cold place, you will choose a high alcohol wine, and in a hot place, you will like to drink white wine or sparkling wine, champagne?	0.533	0.738	
Do you have knowledge of wine?	0.628	0.716	
Do you like drinking wines?	0.598	0.720	
Are you working in wine industry or Is your work related to wine?	0.471	0.750	
Are you interested in learning some wine knowledge?	0.463	0.746	
What type of wine do you like?	0.407	0.835	
Standardized Cronbach ρ : 0.784			

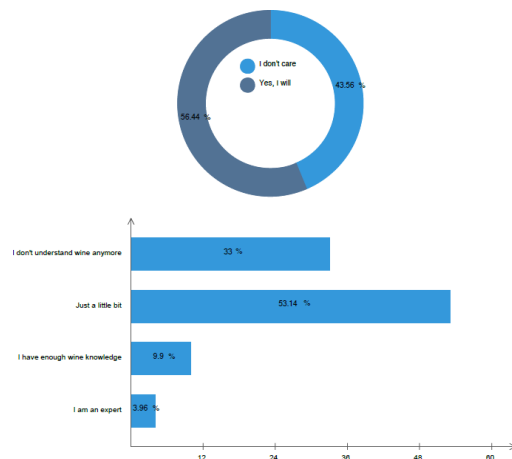


Fig. 7. People’s expectation on vintage and the level of wine knowledge.

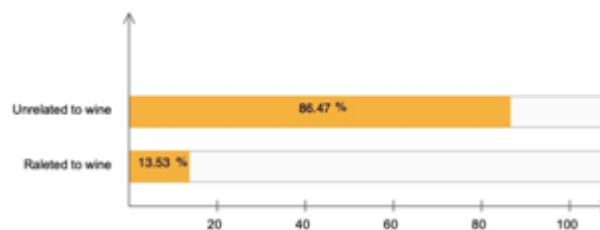


Fig. 8. The image shows the people who have wine related works.

wine as the dependent variables, while people’s perceptions of vintage and “terroir” are independent variables. The P value from Table 2. reflects the positive correlation among these four items [24,25]. The more wine knowledge the people have, the higher perception and expectation for vintage and “terroir”. The same correlation between the wine relevant work and the perception for vintage and “terroir”. Through this analysis, we can say even if just 36.63% of people will choose different types of wine based on temperature, it seems that climate will not directly influence consumer buying behaviors, the consumer pay more attention to good vintage and “terroir”, on which the climate should give a great impact. Additionally, when people are more interested in wine, they would like to learn more wine knowledge, in other words, the effect of climate change on consumer behavior will absolutely become more and more pronounced.

Based on Fig.8, people who are working in the wine industry or have wine related works just present 13.53%, and the rest of them all relate to wine that occupies for a great number of 86.47%. However, Fig.9 shows that, more than 90% of people believe that the Sustainable development of the Chinese wine market is necessary, and 33.33% of them have no idea of what

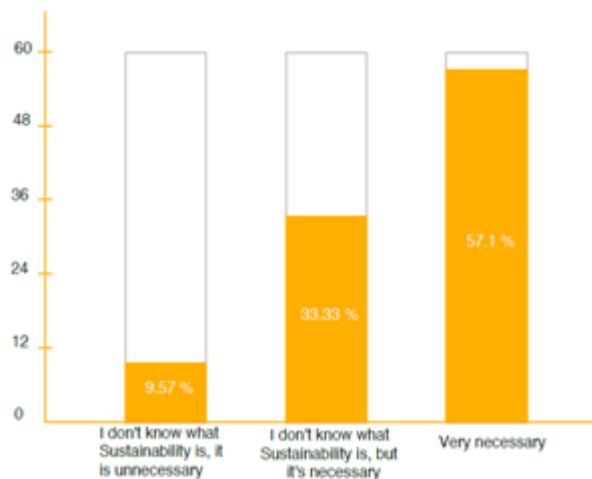


Fig. 9. People’s perspective of Sustainability.

Sustainability is.

B. Main problems the companies face in Chinese wine market.

Although the Chinese wine market is very large with great potentials. Companies in the wine industry face many problems. We did the interview with 10 project managers in small-medium size companies with 10 questions. Details shown in Fig.10.

Among the 10 managers, they all told me that the companies have met kinds of problems especially during the epidemic period. I listed the three main problems. The first is the company’s funds. The epidemic has made the wine market very depressed; they have lost many opportunities to earn money. The second is the lack of professional talents, and the third is a serious loss of employees.

TABLE II PEARSON ANALYSIS.

Pearson Analysis			
		Do you have knowledge of wine?	Are you working in wine industry or Is your work related to wine?
When you are choosing a wine, do you like a good vintage?	Correlation coefficient	0.354**	0.153**
	p	0	0.008
Do you think "terroir" is very important to the taste of wine?	Correlation coefficient	0.402**	0.287**
	p	0	0
* p<0.05 ** p<0.01			

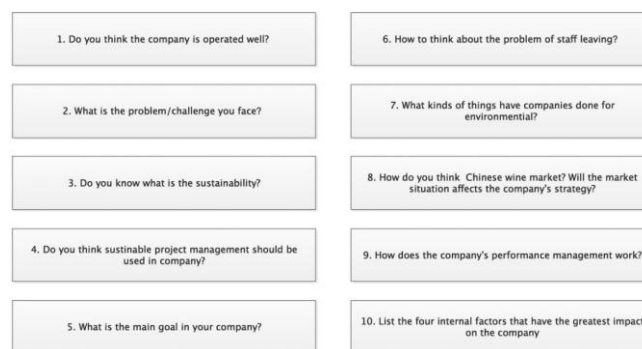


Fig. 10. Ten questions for project managers in the wine area.

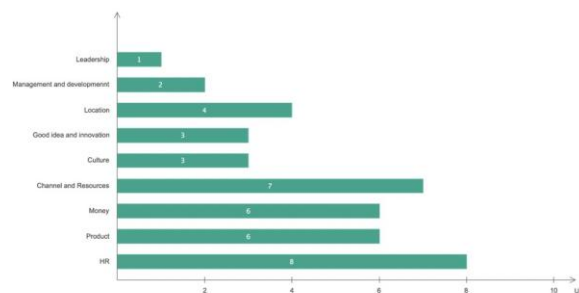


Fig. 11. The 4 internal factors influence company from ten managers.

When it comes to sustainable project management, almost all of managers are interested and support, but when asked them what sustainable project management is, no one could explain the content clearly, so the companies have nothing to do in this regard. Furthermore, companies' goals are all making money urgently. Ten project managers told me that the poor performance management put into practice in companies. Employees always stay late for working, but just few incentives. The function of each department is very unclear due to the small size, so is the low productivity.

The result of last question we have summarized in Fig.11, almost all of the project managers thought human resource is the main factor to the company because staff-leaving is a problem in most wine companies. Importers and distributors pay more attention to resources, channels, products and capital. E-commerce platforms concern about products and online sales channels. Companies which have stores take note of locations, large pedestrian volume and a good location can bring them more business. Furthermore, from a business perspective, senior managers still care about funds and capital, which brings them more limitations that push them to focus on immediate interests rather than long-term development. E-commerce platforms, media companies, or educational institutions will take more care of leadership influences and future development. However, it is noteworthy that none of them proposed the Sustainability in the company.

We will continue to track these ten managers in the future to understand the development of the

company.

III. IMPORTANCE OF IMPLEMENTING SUSTAINABLE PROJECT MANAGEMENT IN WINE COMPANIES IN THE CHINESE WINE MARKET.

A. The 7 Drivers Model.



Fig. 12. The 7 Drivers Model.

On the basis of GPM P5 Standards [26], we created The 7 Drivers Model in Fig.12. On the basis of original elements- products, environment, society and economy, we added three other elements which are culture and diversity, HR, and innovation and technology. These three factors play very significant roles in sustainable project management implementation in wine company in China.

Wine companies are different from other industries that the cultural heritage is very fundamental. We define the culture here not only as the corporate culture, but also the culture of the wine regions. In 2019, global purchases of imported wine totaled US\$37 billion [27]. Fig.13 shows the 10 countries that imported the highest dollar of wine in 2019, and China ranked the fourth. Imported wine covers most of the Chinese market. Nimbility predicted that the market will double in size in 2028 based on the import figures in 2018 and 2019 [28]. Importers and distributors have to know the wine culture from different wine regions in order to sell wines very successfully.



Fig. 13. The image shows the 10 top wine importing countries in 2019.

Human resource is another element that wine companies should pay attention to. Through interviews, it is not difficult to see that employees' outflow is a big challenge faced by wine companies. The surveys show that not many people know about professional wine knowledge in China (Fig.7). A wine specialized employee requires not only personal professional background, but also practical experience provided by the company. However, the outflow of employees makes companies difficult to operate with high specialization and efficiency.

As globalization and high competitiveness in international business. Wine companies need innovation, especially small- medium companies. The wine market all over the world is depressed due to Covid-19. Compared with other wine markets in the world, the great opportunity presented by the Chinese wine market is the online market although E-commerce in China has been developed quite well since the millennium. The project management in companies should not be only system- based optimization, innovation and creativity are necessary. The project's management should focus on the innovation of human resource, performance control, the company management models, and product diversification.

B. Sustainable Project Management Implementation Frame-work (SPM Framework).

The data from survey we made before reflects that Chinese wine consumers have a strong idea of sustainable development (Fig.9), but many as well as senior managers don't know how to practically achieve Sustainability. Among the 10 senior managers we interviewed, all of them thought that sustainable project management is very necessary, but they don't know how to implement it in company, and even think that the company should still focus on making money since it is in small size. Therefore, we proposed Sustainable Project Management Implementation Framework (SPM Framework) in Fig.14. that shows the directions on how to carry on sustainable project management in wine companies in China.

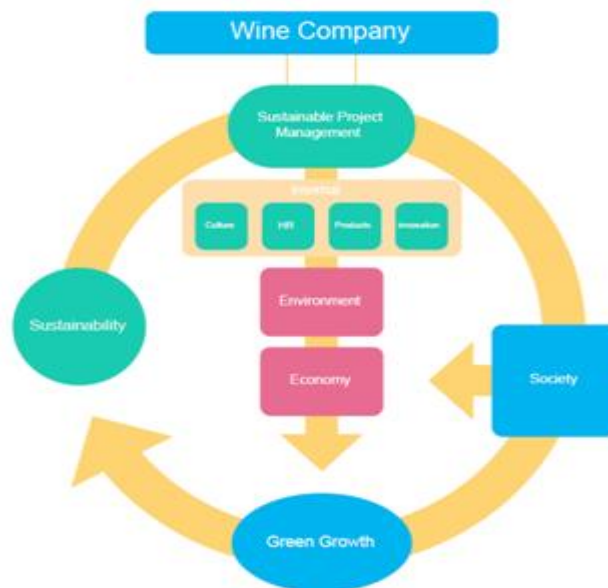


Fig. 14. Sustainable Project Management Implementation Framework (SPM Framework).

Senior managers should attach importance to Sustainability first. According to the data from ten interviews, almost 90% of managers said HR, culture, innovation and products would be the internal main factors for Sustainability implementation. Wine companies not only have to create their own culture although they are always in small to medium size, but also have to know the culture of wine regions. Different wine regions have different cultures, we call "wine culture". If people do not know any wine culture and have no interests in it., then he or she is not suitable to work for any companies in the wine industry.

What's more, almost all of the companies meet human resources problems that they do not know how to control employee-leaving. Employees switch jobs frequently. It takes a long time for a company to cultivate a professional wine talent. Different from other industries, the person who works for a wine company needs to drink wines very often, even every day, to maintain accurate wine tasting feelings. Participating in the domestic and international wine exhibitions is also necessary, in order to know the wine trends and trade opportunities. Thus, Companies have to prepare these kinds of recourses. However, employee-leaving must take away a lot of resources both personal and organizational resources. Therefore, the employee-leaving phenomenon means that all costs the company paid to the employee have become zero, and the company has to

train new people as a starting point.

The third internal factor is products. To position the product accurately, managers are required to have a better understanding of the market. As the CWW model we mentioned before that these three variables are interacting with each other. According to the research of Correlation Between Wine Consumer Behavior and Climate Changes in the Chinese wine market, Climate modification is impacting consumer behaviors and requiring companies to pay more attention to environmental issues at the same time. Sustainable project management will take multiple dimensions, prompt companies to operate effectively and achieve Sustainability both in the environment and economy. In the Chinese wine market, the positioning of products must meet the consumer's needs and satisfaction and must have certain differentiation. They should have a clear marketing strategy based on the research and cognition of consumer behavior. Because of the importance of products' positioning, innovation is an essential element too. Chinese wine companies' outdated management model brings a lot of problems. Although there is a diversification of channels in the Chinese wine market, it also requires companies to develop and operate effectively. Chinese wine companies need innovations and creativity to tap the greater potential in the market.

These four internal factors are like the foundation of sustainable project management implementation. Only a solid and stable foundation can create Sustainability in the environment and economy area. what's more, another "social" factor that we can say is an external factor infects the implementation of our sustainable projects. Policy, social customs, and disaster will have a certain impact on the implementation of sustainable project management. Furthermore, with the current epidemic raging the world and the wine trade war between China and United States, Australia as well, the implementation of sustainable project management can help companies survive, help them achieve green growth and to be more Sustainability.

IV. LIMITATIONS.

There are several limitations in this paper. The main issue is that, the data sample is small. Although these data from different regions in China, we cannot say it has covered all possibilities. For example, the difference between the city and the country, the income gap also affects consumer behavior. And culture diversification in ethnic minorities may make them less exposed to the wine.

Another limitation should be uncertainty factors related to climate change. Although the practical suggestions the paper proposed are very useful, we have to consider the social and economic issues [29] and uncertain international disasters, such as epidemics, financial crisis, which will also impact both on consumer behaviors and sustainable project management implementation.

Finally, geographical and industrial limitations. Although the model we have designed in this paper will give project managers a new direction to operate companies in a more sustainable and efficient way, but the solution is mostly focused on the Chinese wine market. Therefore, we proposed the long-term strategy perspective, but the limitation should be in consideration.

V. CONCLUSION

This paper states the correlation between wine consumer behaviors and climate change in the Chinese wine market and expounds on the importance of sustainable project management implementation in wine companies in China. We propose the CWW Conceptual model in the wine industry that three interacting factors play a vital role in the wine industry, and we focus on two factors that consumer behaviors and wine companies in this paper. We have used survey-based data collection and analysis to interpret that climate changes impact consumer behaviors in the wine industry in China. It obviously shows the sustainable project management should be carried out in wine companies in order to adopt climate influences on consumer behaviors. Furthermore, we have interviewed ten project managers in wine companies in China that found out there were a lot of problems, these managers have no idea about sustainable development. We propose 7 Divers Model that explained seven main factors which will bring the important influence for implementing sustainable development, and SPM Framework that helps companies to implement sustainable project step by step.

In conclusion, the Chinese wine market must become larger and larger with great potential in the future. The international wine business will be more mature with globalization. In the 21st century, when sustainable development has become the world's focus, Sustainability should be the inevitable trend in the wine industry. While paying attention to the environment and climate, we should also accelerate the implementation of sustainable project management in various industries, including the wine industry. In future work, we will further pay attention to the direct and indirect effects of climate change on the wine industry, and the effective implementation of sustainable development project management, which is a meaningful and long-term study.

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