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CAPSTONE

The Development of Armenian Wine Cluster

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I. ARMENIAN WINE CLUSTER ANALYSIS

1. WINE CLUSTER DEFINITION

In this report, wine cluster includes firms and individuals involved in grape growing and winemaking in Armenia. The term ‘wine’ is used to define the fermented alcoholic beverage made from grape. Although there is no official definition of Armenian wine, we consider it as the wine that is fully made from grapes grown in Armenia. From this point of view we can differentiate between wines made from local varieties of grape and wines made from international varieties of grape.

The wine cluster also includes a number of supporting activities and related industries, from education and research to bottling and labeling, tourism and agriculture.

2. THE HISTORY OF WINE CLUSTER IN ARMENIA

Grape growing and winemaking have a long history in Armenia mentioned in the works of Herodotus and Strabo. Back in 401-400 B.C., when Greek armies led by Xenophon passed through Armenia, they were treated with wine which was kept in deep dugouts in special casks called "karases." Archeological excavations have also confirmed the fact that in the ninth century B.C. Armenia was developed as a wine-making state. In 2011, the World's oldest winery was discovered in caves near Areni village dating back over 6,000 years.

Armenian viniculture has been disrupted throughout history by imperial conquests, political revolutions, and shifts in society. During Soviet times Armenian winemakers shifted the production toward cognac and fortified wines (i.e. sherry, Madeira) instead of table wines. This approach rewarded quantity rather than quality. Manufacturing of wine during 1940-1985 increased by 9 times and in 1980s' Armenia annually on average processed about 88.4m liters of wine. The growth was interrupted by the anti-alcohol campaign in the former USSR in 1985, as a result of which the vineyards area decreased abruptly and wine production was cut in half (43.9m liters).

Another shock for winemaking came at the time of declaration of independence of Armenia: the collapse of the industry as a whole and blockade in 1991-1994, resulted wine production reduction to 29.8m liters. 1995-1999 continued by the period of privatization of wine factories resulted in a rapid decline of wine production to 4.7m liters and the vineyards fell into neglect until the late 1990s.

At the end of the 1990s, wine production started to recover slowly. Large investments, especially in procurement of new, advanced technology and improvement of production processes, have been made in the wine sector during 2000s. New vineyards and wineries were established in Armenia, most of which produced wine for export purposes. In 2008-2011, the production increased by around 80% standing at 6.8m liters by 2011[1]. In recent years, the peak has been recorded in 2013 – 7.2m liters, falling to 6.6m liters by 2015 (Annex 1).

The territory of vineyards has largely been stagnant in Armenia since 2010, productivity has been rising from an average of 12.6 ton/ha in 2006-2008 to 15.6 ton/ha in 2013-2015. Grape productions have increased from an average of 202 thousand tons, with 60% procured by winemakers in 2006-2008 to 270 thousand tons (+35%), with 67% procured by winemakers in 2013-2015. Since 2004 wine export from Armenia has been growing by an average of 35% annually (Annex 2). Armenia's share in the world export in terms of both fruit and grape wines doubled in the years of 2005-2010. However, fruit wines' volume in 2010 was ten times more than grape wines' (0.2% and 0.02% respectively).

Overall, there is a tendency among winemaking companies to establish/expand own vineyards. An important factor contributing to this is the opportunity to control the cultivation of vineyards and secure high-quality grapes. Another trend of the last decade has been the establishment of small boutique wine productions (e.g. Trinity Canyon Vineyards, Qotot Wines, Koor, Yacoubian-Hobbs, Keush, Sarduri, Voskeni, etc.), wine bars and wine-testing events, organized by wine boutiques.

The positive shifts in Armenian winemaking haven't passed unnoticed internationally either. For instance, The 2010 Zorah Karasi Areni Noir, made from grapes of the Areni region, Armenia, was ranked in Bloomberg's top 10 list of wines in 2012. Armenia Dry Rose 2014 awarded gold medal at Mondial Du Rose 2015. Armenian wine companies were awarded 23 medals –10 gold and 13 silver– at March 2017 Mundus Vini Grand International Wine Awards in Neustadt, Germany.

3. CLUSTER PERFORMANCE & RELATIVE POSITIONING

According to official statistics, as of 2015, the total territory of vineyards in Armenia stood at 17.3 thousand ha, representing a 10% increase compared to a decade ago. The average productivity in 2015 has been 17.9 tons/ha representing 40% improvement compared to a decade ago. The majority of vineyards in Armenia belong to small rural households, the average size of vineyards being 0.5-0.8 ha. In Vayots Dzor (perceived as the cradle of endemic Areni variety), the average size of vineyards is even smaller, in the range of 0.1-0.3 ha per household. These small farmers also occasionally produce wine for personal use or small-scale unregistered sales in local communities.

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[1] Here and below in the report if not mentioned source: Armenia's Wine Sector: Competitiveness and Recommendations for Investments and Promotion, EV Consulting, 2016.

There are around half dozen large-size vineyards – around 30-40 ha each. A number of winemaking plants have their own vineyards of varying size. For instance, this ranges from +420 ha for Karas, ~ 30-40 ha in case of Armenia Wine to ~ 60 for Vedi Alco and to 120 ha for Golden Grape Armas. Other wine producers that have their own vineyards include MAP, Artashat Wine-Cognac Factory, Maran, Van Ardi, Trinity, etc. There are also producers that do not possess own vineyards and procure grape in the market, e.g. Voskevaz Winery.

Around 15-20% of the vineyards are used for wine production, as the majority of vineyards grow white grape for the production of brandy. There are about 50 winemaking companies in Armenia. Around 30 of them have been established in the last decade (about half of them - in the last 5 years), located in the most important wine regions.

Per capita consumption of wine in Armenia is estimated at 1.6 liters[2]. During the 2013-2015 period, import of wine to Armenia has been around 380 thousand liters annually on average The 474 thousand liter import in 2015 compares to approximately 7% of local production. In 2015, volume of exports exceeded that of imports by around 5 times. Armenia imports from a number of global top producer countries. Both in value and physical volume terms, France and Italy lead in import of wines to Armenia. Italy accounts for around half of the import value, followed by France – 30%. In physical terms, France and Italy cover around 60% of the imports. Other import sources include Spain, Chile, USA, etc.

In the last decade, export of Armenian wines has recorded significant growth. In physical volume, exports have recorded 22% CAGR, increasing from 0.7 million liters in 2006 to 3.4 million in 2014. In 2015, the distribution of grape and cider & fruit wine export was 56% and 44%, respectively. Sparkling wine forms tiny proportion in grape wine export – about 6%. In value terms, exports have recorded faster growth: 25% CAGR in the last decade, increasing from $1.7 million to 10.2 million in 2006-2014 period. Nevertheless, Armenia still captures insignificant proportion of the global wine market – 0.01 in grape wine segment and 0.2% in cider & fruit wine segments.

In the grape wine segment, Russia had around 80% share as of 2016[3] in physical volume terms and accounted for three-quarter of the export value. In the fruit wine segment Russia again traditionally dominates – with 58% in value terms, in 2016.

4. CLUSTER LOCATION AND CLUSTER MAP

Wine cluster location should be considered in 2 dimensions: locations of vineyards and

[2] Source: National Statistical Service of Armenia
[3] Source: UN Comtrade Database

locations of wineries.

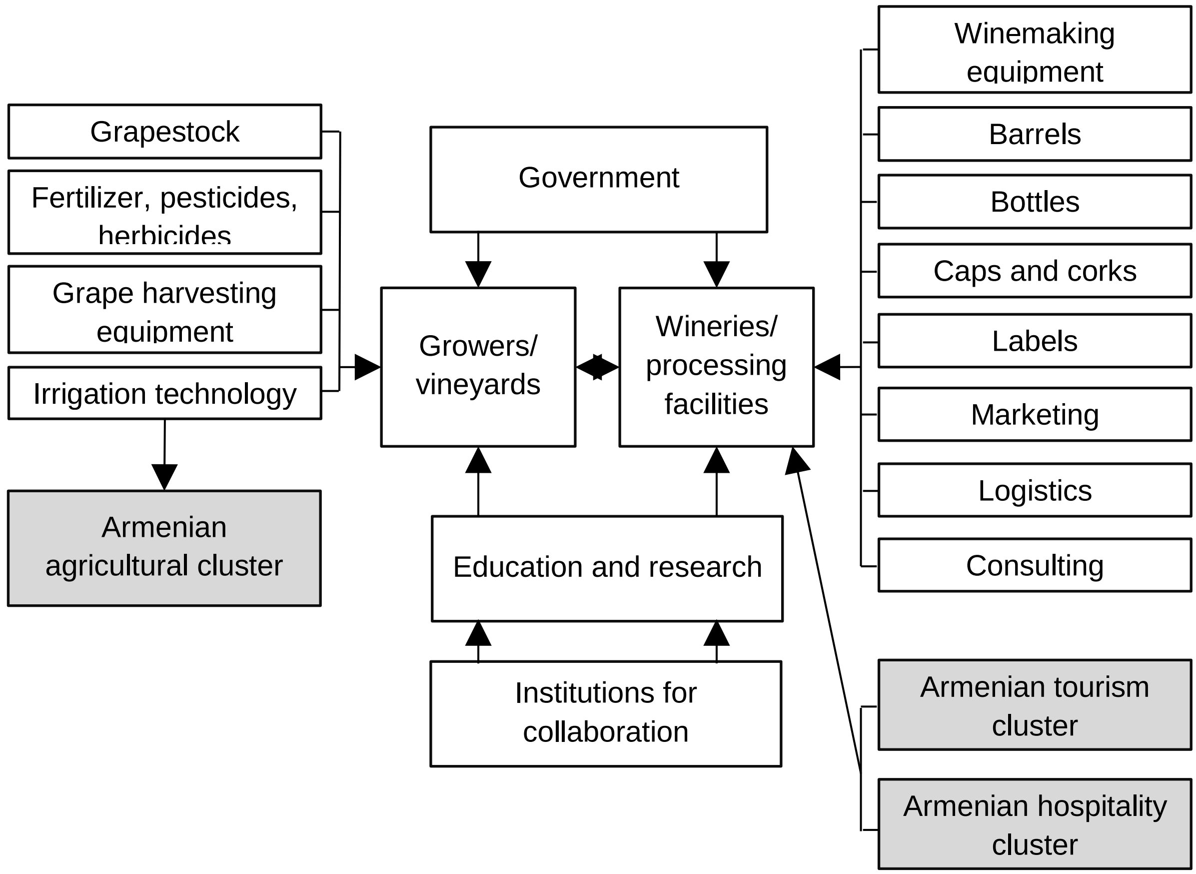
The vineyards are spread almost all around the country, excluding Gegharkunik and Shirak regions. The largest area of vineyards and the highest amount of yield are concentrated in Armavir and Ararat regions. Armavir and Ararat regions account for around 70% of vineyards as of 2015. In 2015, compared to 2010-2012 period, vineyards in 5 regions have recorded growth (Annexes 3a, 3b and 3c).

In terms of winemaking the locations are also spread, yet here the focus is rather in Vayots Dzor region with fewer wineries in Aragatsotn, Armavir, Ararat and Yerevan (Annexes 4a and 4b).

CLUSTER MAP (illustrated in **Figure 1**)

Government. The cluster is regulated by the Ministry of Agriculture, which is responsible for the state policy and programs implemented in plant growing and agro-processing, and by the Ministry of Economy, which is responsible for the Industrial Policy. In 2016 June, the Government established a separate body responsible for the development of viticulture and winemaking in Armenia – the Vine and Wine Foundation of Armenia (VWFA).

Figure 1. Armenian Wine Cluster Map



Supporting activities. There is a broad spectrum of supporting activities both for grape growing and winemaking, ranging from nurseries for growing grapestock to wine consulting services provided to cluster participants. Issues are present in almost of these activities, while some of them present opportunities for unique advantages to the cluster, like the availability of Caucasian oak tree for local barrel production.

Related clusters. There are three clusters that have major impact on wine cluster: the agricultural, tourism and hospitality clusters. The agricultural cluster mainly is related to grape growing, while tourism and hospitality clusters are drivers for the development of demand for Armenian wines.

Education. The Armenian National Agricultural University provides a degree in Fermentation Technology and Winemaking, while EVN Wine Academy offers a professional 18-month certificate program in Enology and Wine Business. Nonetheless, lack of skilled workforce is one of the major problems of the cluster.

Institutions for collaboration. Several institutions for collaboration (IFCs) exist in Armenia, such as the Union of Young Winemakers, Armenian Association of Winemakers, and Vineyards of Armenia, however, none of them represents the whole cluster and has enough power to affect and shape it.

5. CLUSTER DIAMOND

Diamond analysis for Armenian Wine Cluster is illustrated in Figure 2 with a summary of competitive advantages and challenges for the cluster.

A. FACTOR CONDITIONS

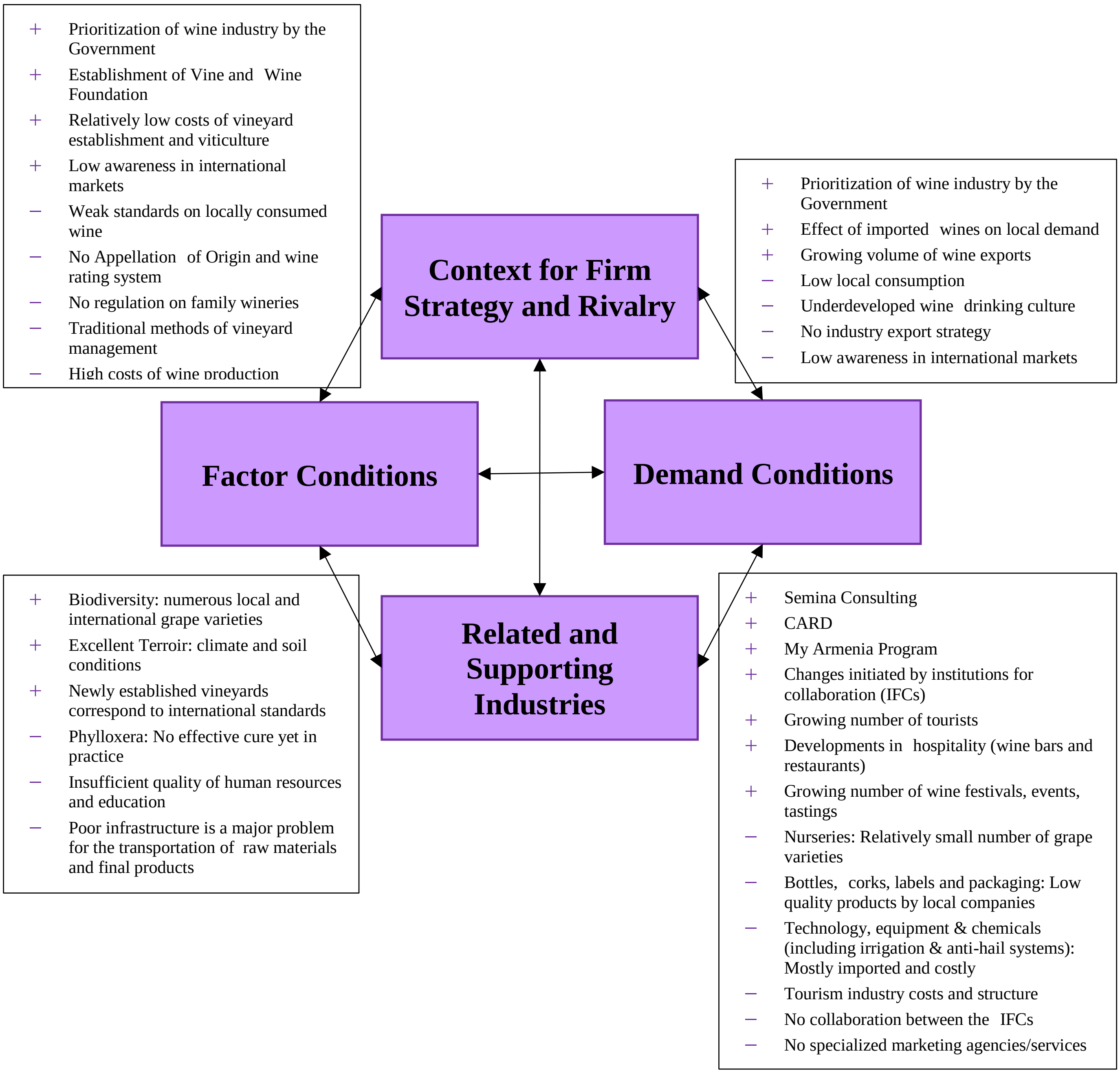
The Biodiversity and Grape Varieties. In Armenia wines both local and international varieties grown in Armenia are used. There are 125 local grape varieties preserved in Armenia, among which 70 are old autochthonous varieties[4]. The autochthones include Areni, Kakhet, Voskehat, Khatun Kharji, Movuz, Sireni and Chilar, widely used in Armenian wines. The international grape varieties, such as Merlot, Malbec, Syrah, Tannat, Chardonnay, Viognier, Muscat, Cabernet Franc, are also grown and used in Armenian wines. Some regional grapes, like Saperavi and Rkatsiteli, are cultivated in Armenia and used by Armenian winemakers as well.

However, the biodiversity, especially that of the local varieties, has been in certain danger for many years. Starting from the anti-alcohol campaign in the USSR in 1986 and followed by the privatization of the vineyards and wine factories in 1991, many of the vineyards were destroyed, which brought the varieties to the brink of extinction[5]. Another danger to the biodiversity is the Phylloxera pest, towards which the local varieties are not resistant.

Phylloxera. The Phylloxera is a grapevine parasite that spreads from one spot to another, attaching to the tires, bins, machinery, shoes, etc. For now by far the only way to fight the phylloxera are the rootstocks of the native American varieties, that are resistant towards the pest.
The approach to the Phylloxera problem in Armenia is not quite effective: destroying the infected vineyards to prevent the pest to spread. This is hardly possible, as by the time the pest is discovered and the vineyard is destroyed, a considerable amount of pests had already moved around the neighbourhood. This approach is also harmful for the winemaking, as well as for the biodiversity of the grape varieties.

[4] Aroutiounian, R., Nebish, A., Melyan, G., & Margaryan, K. (2015). Phenotypic profiles of Armenian grape cultivars. BIO Web of Conferences, 5, 01011. doi:10.1051/bioconf/20150501011
[5] Wall, R. (n.d.). History in a Glass: (Re)discovering Armenian Wine. Retrieved April, from http://www.folklife.si.edu/talkstory/2016/history-in-a-glass-rediscovering-armenian-wine/

Figure 2: Armenian Wine Cluster Diamond



The Terroir. Armenia is a territory marked with frequent tectonic activity and, therefore, volcanic soil, which is considered as ideal for grape cultivation. The average altitude is 1,800 meters, with only 1% of the territory below 1005 meters[6]. The mountains and valleys result in

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6 Mints, A. A., & Howe, G. M. (2017, March 14). Armenia. Retrieved April, from

a range of microclimates. The grapes grow from the lowest elevations of 610 meters above sea level to the highest at 1740 meters. Armenian vineyards are some of the highest in the northern hemisphere.

The combination of very hot summers and very cold winters give the grapes boldness and "a certain maturity." The extreme climate produces grapes with high acidity, eliminating the need to add tartaric acid during the winemaking process – a common practice in the New World. These factors, alongside with the water composition, significant amount of sunny days form one of the nearest to ideal terroirs in Armenia.

Vineyards. Density of plantations of old vines are 2,400 plants per hectare (2.80m space between rows x 1.50m space between vine plants), whilst new plantations are done with 4,000 plants per Ha or more. This number corresponds to what is recommended in Europe, changing plots planted at wide space between rows to more narrow space, because higher amount of vine plants per Hectare enable higher competition between plants, increasing the quality afterwards. Nevertheless, it is feasible if there is enough water available. Depending on the area, some wineries have done ponds for this purpose (Karas).

Human Resources. The winemaker is the one person responsible for the quality, taste and sales of the wine. Therefore a good winemaker is proficient in viticulture, winemaking, management and winemaking, and is aware of all the legislations, regulations and procedures related to the industry.

According to surveys held by the ICARE in 2014, the lack of skilled specialists is a problem in several areas: production unit supervisors, mechanics in the vineyard and winery, laboratory staff, biochemists, technologists, winemakers, unskilled workers and even accountants are lacking. The inappropriateness of education for the received specialty is the main problem mentioned in all of the fields. Another problem is the lack of skills required for the job, due to the scarcity of practical part in the education curriculums. The third problem is the lack of experienced specialists [11].

Only 4 of the 83 vocational education entities in Armenia are offering a state diploma of qualified technician in the fields of "Fermentation Technologies and Winemaking" and "Winemaking and Juice Production". Those are Yerevan State Armenian – Greek College of Tourism, Vayots Dzor Regional State College, A. Kochinyan College of the Armenian National Agrarian University and Armavir Regional State College[7].

Established in 1930 in Yerevan, Armenian National Agrarian University (ANAU) is still the

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https://www.britannica.com/place/Armenia

[7] Baseline Study of Armenian Wine Sector, ICARE, 2014

only higher educational institute in the agrarian sphere which provides bachelor's and master's degree programs on Fermentation Technology and Winemaking[8]. However, wine producers remark that the education received in ANAU doesn't go well with the industry requirements and prefer to invite professionals from overseas or send their workers for trainings abroad[9]. The list of subjects of Fermentation Technology and Winemaking undergraduate program only proves the insufficient quality of the education given: out of 5 years of studies the first 2 years students don't study almost any subject related to winemaking, and the rest 3 years do not comply with modern requirements of the field.

In 2014 the EVN Wine Academy was established by the ICARE and Semina Consulting. The academy's 18-month certificate program in Enology and Wine Business, founded, developed and taught jointly with the Geisenheim University. The EVN Wine Academy offers also short trainings for professionals and wine enthusiasts[10]. The Wine Academy team is collaborating with the ANAU, trying to improve the curriculum for the future winemakers and to align it to the international standards in time.(from the interview)

Research and Development. Viticulture, Fruit Growing and Winemaking Scientific Center operates under the roof of ANAU Foundation in Yerevan[11]. It is engaged in the study of gene pools of grape cultivars, gathering of grape varieties, winemaking, fruit growing and brandy production technology development, new grape varieties description, etc. On the bases of those studies, the gene pools and the description of new selection varieties made in the center, are published in 3 Ampelographies of grape and fruit varieties and in 5 volumes of "Armenia fruits". Currently two scientific and research projects are conducted by the center "The Implementation of New Technologies in the Field of Viticulture, Fruit Growing and Winemaking" (base funding) and "The Study of White Grape Varieties to be used as a Raw Material for the European Type White Wine Production".

Infrastructure. Armenia is a landlocked country and mainly relies on land transport and cross-border access. Transportation network is important for wine cluster both in terms of transportation of the grapes and other products to the winery, and of transportation of wine from the winery to both local and international consumers. The roads are also important for export, as the main foreign market for Armenian wines - Russia, is reached through them.

Only two of four international borders of Armenia are open: the border with Georgia in the north and the border with Iran in the south. The low temperatures and heavy snowfalls during the winter months result in high transportation and infrastructure development and

[8] Armenian National Agrarian University website (https://www.anau.am/en/faculties/foodtech/171)
[9] Baseline Study of Armenian Wine Sector, ICARE, 2014
[10] ICARE Foundation website (https://icare.am/evn)
[11] Armenian National Agrarian University website (https://anau.am/en/science/2013-02-28-11-06-51/870-2013-05-18-06-45-11)

maintenance costs. The total road coverage is 10818 km[12]. According to the Road Quality Indicator, Armenia is ranked 75 globally[13].

The railway network consists of 845 km electrified line, most of which is single tracked[14]. According to World Economic Forum's assessment in terms of railroad infrastructure quality, Armenia ranks 71 globally[10]. Railway has a potential in terms of wine transportation both in the country and abroad, however, currently it is largely segmented and is not utilized by wine producers.

6 airports operate in Armenia, from which only 2 are international: Zvartnots airport in Yerevan and Shirak airport in Gyumri[15]. Zvartnots airport was granted second class ICAO in 1986[16]. The Shirak Airport was granted first class ICAO in 2007[17]. In October 2013 Armenia adopted open sky policy and many international airlines entered the market. The quality and availability of international airports and carriers is important in terms of the development of tourism, as due to high costs Armenian wine is not exported by air.

The irrigation system and therefore the irrigation water infrastructure are among the key factors influencing the grape quality. The vineyards require extensive focus on water supply for the vines during the just before bud break, early in the spring, flowering and put set up in the beginning of summer and ripening in between mid-September and mid-October. In climate conditions of Armenia, generally, irrigation is required during all the three phases, though this can vary yearly.

Financial infrastructure. Currently, there are no special financial products aimed to winemaking segment. Several organizations provide agricultural loans, which can be applied for vineyards as well.

B. DEMAND CONDITIONS

In the diamond model of national advantage developed by Michael Porter demand conditions refer primarily to the domestic demand for the cluster's product or service. In his book, On Competition[18], Michael Porter emphasizes the importance of domestic demand, claiming that "nations gain competitive advantage in industries where the demanding (domestic) buyers pressure companies to innovate faster and achieve more sophisticated competitive advantages than their foreign rivals". Porter further claims that it is the character of the domestic demand, rather than its size that matters.

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[12] https://think-asia.org/bitstream/handle/11540/982/armenia-transport-outlook.pdf?sequence=1
[13] Armenia infrastructure: transport, communications, energy. (n.d.). Retrieved from http://www.theglobaleconomy.com/Armenia/overview-infrastructure/
[14] Uden, M. V. (n.d.). Railfaneurope.net. Retrieved from http://www.railfaneurope.net/list/armenia.html
[15] http://www.airports-worldwide.com/armenia.php
[16] About us. (n.d.). Retrieved from http://www.zvartnots.aero/en/about-us
[17]http://www.zvartnots.aero/en/shirak-airport
[18] Porter, M. E. (2008). On competition. Boston (MA): Harvard Business School Publishing.

In case of Armenian wine cluster both the size and character of the domestic demand are lacking the sophistication needed to challenge local producers. Per capita consumption of wine in Armenian is still much lower than the consumption of spirits and beer[19]. This number is also noticeably behind of group of wine producing peer countries such as Moldova, Georgia and Macedonia.

The wine-drinking culture in Armenia didn’t have opportunities for development both during Soviet era and early post-independence years. However, in recent times there is a positive trend in the local wine consumption with a number of newly opened wine bars and rising awareness about wine among the youth. One reason for the positive changes is the constant prioritization of wine sector by Armenian government and the successes of several Armenian wines internationally. Another reason for the development of local demand has been the growing volume of imported wine from different countries, mostly from France.

In the long-term, the growing sophistication of the local demand will help shape the wine consumption culture in Armenia which in turn will trigger the development of the wine cluster.

Although the global demand for Armenian wine cannot fully substitute the domestic one, it is still an important driver for the cluster development. In the last decade, the export of Armenian wines has recorded significant growth, however Armenia still captures insignificant proportion of the global wine market.

The largest export market of Armenian wines is Russia, followed by USA, with almost 74,019 liters (Annex 5). Export to Mexico and Philippines is little in total value terms, however, in 2016 it had the highest value in export per liter. In the last decade, the share of exports to EU has increased; the main destinations are Lithuania and Italy.

Another emerging market is China. Although its share in exports currently is low both in total value and value in export per liter terms, several participants of the cluster think that it’s the market Armenian producers should seek to enter[20]. However, the Chinese market has several drawbacks including it being severely segmented and the lack of ties and connections between those segments which makes the marketing and promotion of wines in different segments of the markets very costly. Another drawback is the active and long-term presence of large international higher quality wine producers there, competing with whom will again cost too much.

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[19] Source: National Statistical Service of Armenia
[20] Source: http://en.a1plus.am/1253873.html

The average FOB prices of Armenian wines in the export markets have been increasing during the last decade. In the Russian market export prices of Armenian wine are average, while in US and EU countries in the lower-price category. However, the average export price of export wine to US and EU is considerably higher than that for the Russian market.

The awareness on Armenian wines in international markets is low. In the largest export markets - Russia and USA (California, in particular), an important consumer segment for the exported Armenian wines is the Armenian Diaspora. Low awareness can be viewed as an opportunity for creating a brand for Armenian wine from a scratch.

C. FIRM STRATEGY, STRUCTURE AND RIVALRY

In 2011 Armenian Government has adopted country's Export-Oriented Industrial Policy were winemaking was included as one of the main industries in the second phase development program (2011-2015). In the course of the years in the framework of the policy investments were made in winemaking related areas, e.g. wine festival funding, creation of wine related associations, etc. However, the industrial policy as a whole remained underperformed.

Governmental Program approved in October 2016 put the increase of the rating and competitiveness of Armenian winemaking as the last point in the Agricultural development plan and defined for it three-point action-plan:

- Organization of "World of Wine" conference in 2017 in Armenia,
- Supporting the participation of Armenian wines in an international competition,
- During three-year period arrangement of the compliance of local wine quality standards and criteria with international requirements (EU, EEC and of Asian countries).

While the first two points are important for raising awareness about Armenian wines internationally, the third point has a larger importance. The RA Law on Alcoholic Beverages on the Basis of Grape (2008) gives basic definitions of different kinds of wine produced in Armenia, setting benchmarks for spirits, carbon dioxide and other chemicals contained in them. According to the database of National Institute of Standards there are 8 National Standards (ASTs) on wine[21]. However, when it comes to the exports of wine, standards imposed by each country or union of countries are numerous and vary from country to country. On one hand this situation creates additional hardships for producers who want to export their product, on the other hand the lack of strict wine standards for locally consumed wine negatively affects the development of local demand for Armenian wine. Tests for compliance with the mentioned standards are paid; the laboratory of National Institute of

[21] http://www.sarm.am/en/standarts/search?number=&keyword=wine&developer=&category=0&status=-1&startOf=

Standards does some of them, while others can be conducted by private laboratories both in Armenia and abroad.

The main legal act in the winemaking sector is the above mentioned RA Law about Alcoholic Beverages on the Basis of Grape (2008). The Law regulates relations on grape cultivation, production of spirits on the basis of grape, their labelling, marketing and sales. It defines 9 larger regions in Armenia for grape cultivation, but does not prohibit cultivation of wine outside of those regions. Provided the different natural and climate conditions for viticulture in a region, the Law allows further separation to macro-regions and micro-regions. The names and borders of the macro-regions and micro-regions need to be defined by the Government decree. By the time of preparing the current study, no such were defined. Existence of such smaller regions has the potential to become the basis for appellations of origin.

Appellation of origin is a legally defined and protected geographical indication used to identify where the grapes for a wine were grown. Restrictions other than geographical boundaries, such as what grapes may be grown, maximum grape yields, alcohol level, and other quality factors, may also apply before an appellation name may legally appear on a wine bottle label. The rules that govern appellations are dependent on the country in which the wine was produced[22]. Such appellations are necessary for the international competitiveness of the wine, as the concept of terroir is one of the most important criteria for assessing wines. Standards for provision of appellations of origin can also set wine rating system, which will allow to differentiate between high, medium and low quality wines produced in Armenia.

Somehow misleading situation about appellation of origin is created by the RA Law on Geographic Indications which refers to Intellectual Property Agency is a body responsible for provision of such indications. The website of the Agency[23] mentions appellation of origin as a category of Geographical Indications and specifies a procedure for companies to get one. However, the Registrations page reveals 7 products that have received appellation of origin from the Agency, 6 of which are Georgian wines. This creates confusion, as each country can and should provide appellation of origin only to products produced on its territory by setting specific rules and standards.

In 2016 June, the Government established a body for the development of viticulture and winemaking in Armenia – the Vine and Wine Foundation of Armenia (VWFA)[24] investing 103.3 million AMD. Additional allocation of 108 million AMD has been made by the Government in December 2016. VMFA’s functions according to their website present a whole concern a variety of spheres inside the cluster from enhancement of viticulture to

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[22] Source for definition: https://en.wikipedia.org/wiki/Appellation

[23] Intellectual Property Agency - http://www.aipa.am/en/reg-process/ (please, note that English version of the website does not contain information on Geographical Indications)

[24] The website of Vine and Wine Foundation of Armenia - http://vwfa.am/

triggering wine consumption culture in Armenia. The board of trustees of VMFA mainly consists of representatives from governmental Ministries, but also includes executives from wine producing companies, wine consulting and one IFC.

It is perceived that VMFA will largely take over the coordination of support to the winemaking sector previously provided through the Development Foundation of Armenia. As of December 2016 activities of the Foundation were rather chaotic without following specific strategy[25] and were mainly aimed at raising awareness about Armenian wines abroad.

While viticulture is exempt from value added tax (VAT) as part of primary agriculture, there is 20% VAT on wines, although wine exports are tax-free. Additionally, there is approximately $50 state duty expense for wine-making activities paid annually (RA Law on State Duty).

As part of the Eurasian Economic Union there are no customs duties for importing equipment and other supplies for winemaking from countries that are part of Eurasian Economic Union, however duties on imports from outside of the Union are equal to 10%.

Export Insurance Agency provides trade insurance for Armenian exporters since 2015. Since 2016 March, the state (via the Development Foundation of Armenia) fully subsidizes the insurance expense of wine producers (winemaking sector is prioritized for state support for export purpose by the Export Promotion Council). In addition, the Export Insurance Agency subsidizes (up to 6%) the interest rate of factoring and pre-export financing for procuring raw materials for the businesses that have got insurance from the Agency.

The winemakers in Armenia could be divided into three main groups. There are around 30 recent (more or less large) private wineries which have their own vineyards in order to manage better the vine growing and quality of the grapes. Then there are several quite large vineyards supplying grapes to large wineries. The third group includes numerous small farmers who own small vine land, they either make wine from their own grape or sell the grape to bigger wineries. Those farmers represent the majority of all vineyards in Armenia, influencing directly the quality of the wine and its costs.

Around two-third of the wineries who procure grapes directly from individual farmers claim to make in-advance agreements with individual rural households to procure grape in season. The procurement price for grape is normally determined for 1 kg of the given variety and does not generally depend on the grape quality. An influencing factor is the volume of national harvest (largely affected by the climate conditions during the year).

[25] See the list of activities conducted by VMFA at http://www.tert.am/am/news/2016/12/29/Jivalyan/2235213

Rural households, farmers and most of the grape producers (including wineries who have their own vineyards) use traditional methods for grape growing and vineyard management (pruning, canopy management, vineyard practices, irrigation method, spray of chemicals for treatments, etc.). These practices do not lead towards effective quality standards for grapes in order to compete with international producers. Only few of the grape growers apply more international standards practices.

Cost of establishment of 1 ha vineyard in Armenia and cultivation in the first 3 years is estimated to be in the range of that for peer countries – Georgia and Moldova, standing at around $18-22 thousand on average. This is by almost one-fifth lower, on average, than the respective costs in another peer country in Europe - Macedonia. Compared to developed wine producer countries, the establishment costs in Armenia work out to be significantly lower – e.g. by 70% compared to the USA, on average. While Armenia is estimated to enjoy comparably low costs of production in viticulture and be in same ranks with the peer countries, in wine-making, Armenia falls behind on cost competitiveness.

D. RELATED AND SUPPORTING INDUSTRIES

Supporting Activities

Nurseries. Nurseries are needed for growing grape vines until they are mature enough to be planted in grape yards. In Armenia, Semina Consulting has established 2 vine nurseries: Astghadzor Nursery in Vayots Dzor Region of Armenia (the grape varieties include: Kakhet, Voskehat, Tchilar, Nazeli, Khatun Kharji, Mormor, Movuz, Jrali Kara, Vardaguyn Yerevani, Tigrani) and Khramort Nursery in Artsakh (the grape varieties include: Khndoghni, Kangun (Armenian Complex Hybrid), Rkatsiteli (Georgian))[26].

Barrels. The producers procure barrels both produced locally and abroad. Some of the new wine producers (e.g. Golden Grape Armas) procure barrels (especially, large-size) from Europe (Italy, France). Locally, the production takes place mainly in Artsakh from Caucasian oak tree with few productions in regions of Armenia (e.g. Tavush). Barrels made locally vary by sizes and inside heating (light, medium or heavy toasted). Know-how of barrel production in Armenia is traditional, however there is a space for improvements related to machinery, health-safety standards and quality control.

Corks, labels and packaging. Corks are virtually entirely imported - mainly from Portugal, and also from France. Labels and packing are procured both from local companies and from abroad. The latter forms smaller proportion and is done mainly by producers of high-end segment wines seeking premium quality and for whom cost consideration is not 1st-tier issue.

[26] Source: Semina Consulting website (http://semina.am/#section-projects)

Regarding the procurement of labels and packaging locally there is a lack of high quality printing companies in Armenia.[27]

Bottles. Similar to barrels, the bottles used in wine-making are procured both locally and from abroad. The local producer is Saranist Company. While in the last 2-3 years, the company has improved quality of bottles and has lowered price, certain local wine-producers prefer to procure from abroad. Nevertheless, the company supplies not only to approximately 60-70% of the Armenian wine production (Armenia Wine, Proshyan, MAP, etc.), but also to Georgia – where it supplies up to 70% of its production. Bottles of Armenian wines, however, are heavier than those produced in France, Italy or other countries, which automatically decreases the amount of export.

A number of new producers who make premium quality high priced wines (e.g. Zorah Wines, Golden Grape Armas) procure bottles from abroad as they seek high quality and large range of Italian/French bottles. Another reason for procuring bottles abroad, mainly from Russia is that it works out cheaper to acquire larger range of bottles from there.

While all wineries use glass bottles for their wines, the majority of home-based winemakers prefer cheap plastic bottles. This is an issue not only from environmental and food safety perspectives, but it also harms the image of Armenian wine, as many visiting tourists see and even buy such wine on the roads of Armenia.

Technology and equipment. Having more than half of the existing winemaking companies established in the last decade, the technological base in the cluster is relatively up to date. All the technology used is procured, mainly from EU countries, particularly from Italian, French, German producers. However, due to the lack of after-sales service, the maintenance of the equipment is a problem.

Although the old wine factories established before the independence or during early 1990s have significant use of old equipment from Soviet times, in last 5 years certain old-established producers have started to renew their productions and acquire new/used European equipment.

What comes to technology used in grape growing cultivation cost structure reflects that the equipment & machinery is used poorly compared to developed producer countries. Some technologies are also hard to implement in Armenia, e.g. automatic grape collection equipment, because of the structure of the vineyards. As weather has a big influence on grape growing, some of the large-scale wineries, e.g. Golden Grape Armas, rely on anti-hail systems in order to protect their harvest against unexpected weather conditions[28]. However, anti-hail

[27] Interview with Aimee Keushguerian, Semina Consulting Representative
[28] Interview with Golden Grape Armas CEO Victoria Aslanian

systems are unavailable to the vast majority of grape growers.

The international suppliers of equipment and technology do not have official local representations.

Chemicals. Chemicals (e.g. yeast) used in winemaking are mainly imported. Some of the chemicals supplied locally include tartaric acid. Main importers are Center for Agribusiness and Rural Development, Medisar, Semina Consulting, etc. However, such chemicals are usually unavailable to small home-based winemakers because of their high prices.

Laboratories. The under-developed quality assurance infrastructure is reflected in relatively high cost of laboratory tests in Armenia, and large winemakers include laboratories in their production facilities. Top two independent laboratories are the Armenian Institute of Standards, and "Tonus Les". Both laboratories conduct the generic tests, and lack the specification of analysis that would contribute to the wine quality. Moreover, Yerevan wine academy has enabled learning through educational laboratory open students and researchers of the university. The research center, however, lacks the supply of reagents, which are either expensive or cannot be ordered within a reasonable timeframe.

Sales and Marketing. Armenia lacks an international sales force, and the local wine sales are organized through

- Unregistered sales from local small producers through bazaars and word of mouth. The method lacks any quality control
- Supermarkets for bottled, or small barrel sales
- Established boutique wineries, like Trinity Canyon Vineyards, Qotot Wines, Koor, Yacoubian-Hobbs, Keush, Sarduri, Voskeni, etc.

The wineries usually use the services of professional distributors in Armenia. As mentioned by cluster participants, such distributors sometimes can create issues and confusions in the cluster by promoting certain wines over the others, or selling the wines in their own stores with the same price they sell the wine to other markets, wine bars and restaurants. Another problem is the fact that wineries don't give any instructions on the price of the wine in the market, so the distributor decides the margin. In this way some certain wines are sold more expensive in Armenia, than abroad, and other wines that according to their quality belong to higher price range, are sold cheaper.

In the local market information about the wine is spread through

- Shelf advertising
- Mass marketing – broadcast media, escalating especially on dates of holidays (e.g. New Year, Easter, etc.)

(https://www.youtube.com/watch?v=TpxsdHFXJUU)

- Wine festivals
- Local and International Wine Awards (e.g. Mundus Vini)

Strict laws forbid the advertisement of alcohol drinks in electronic form for certain hours, direct consumption of beverage on television advertising, etc.

When it comes to marketing of Armenian wines in international markets, wineries usually lack the capacity to organize it successfully themselves and there are no special wine marketing agencies to fill this gap.

Consulting. Semina Consulting offers a wide spectrum of services ranging from viticulture consulting services, planning and planting vineyards, winery design and installation to wine production as well as marketing, sales and distribution (Annex 6). The company has done Karas, Kataro, Kush noteworthy projects in Armenia, as well as cofounded EVN Wine Academy[29].

Logistics. Armenian exports have relatively small geographical diversity, with the largest export market of Russia. There is a limited range and scale of distribution channels in existing and potential export markets.

Market intelligence of wine producers is rapidly increasing throughout the past years, however, it’s coupled with inconsistent, low-budget and small-scale marketing and promotion activities worldwide.

Supporting Projects.
Central for Agribusiness and Rural Development Foundation (CARD) is a full successor of United States Department of Agriculture’s Marketing Assistance Project (USDA-MAP), developed in 2005. CARD particularly works on developing and improving the Armenian wine industry, focusing on vines, winemaking, and irrigation and harvest techniques. It helps farmers increase yield and improve the quality of Armenia’s wines. It provides marketing, bottling and labeling assistance. CARD sponsored model wineries in Vayots Dzor initiating new boutique wineries development[30].

My Armenia Program is a collaborative cultural sustainability and tourism program between USAID, Smithsonian Institution, and the people of Armenia. In the framework of the project there will be implemented several marketing and communication strategies in order to make Vayots Dzor Region a destination for tourists, as the center of Armenian winemaking.[31]

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[29] Semina Consulting website (http://semina.am)
[30] CARD website (http://card.am/wine)
[31] Interview with Vahe Darbinyan, Program Specialist at Smithsonian Institution

Associations

Young Winemakers' Union: It was founded in 2012 and currently has 30 young members. The goal of the association is to boost wine industry development in Armenia and support young winemakers to get training courses and build their career paths in the field. One outstanding project which YWA had cofounded is EVN Wine Academy. The head of YWA Zaruhi Muradyan stated that the field is lacking local professional and skilled winemakers so they initiated the project to narrow the existing gap. Currently, the association is going to implement some projects related to tourism development in the region, support local small winemakers to produce better quality wines and sell in better conditions. They organize Armenian wine promotion events to raise the awareness among consumers and also do yearly research around Armenia to find out which age segment prefer which type of wine of what producers' products and in which price range and to understand Armenian market demand. The latest research showed that preferences among consumers are changing in favor of Armenian wines. The association cooperates with VWFA, Areni Wine festival and Semina Consulting.

Related Industries

Tourism and hospitality. Tourism and hospitality infrastructures' development are among the priorities of the Government of the Republic of Armenia. The number of incoming tourists during the last ten years has more than doubled and the average annual growth rate is 10%, for 2015-2016 this rate was 5.7% reaching 1.259.657 visitors in 2016. According to tourism and travel competitiveness report of 2017 published by The World Economic Forum, Armenia takes 84th place among 136 countries by the index of tourism competitiveness in the world thus improving its rate with 5 more places.

Foreign citizens (except for those from some countries of the Commonwealth of Independent States (CIS)), traveling to Armenia must obtain an entry visa. According to USAID Enterprise Development and Market Competitiveness descriptive analysis 2014, 66% visitors are from diaspora and 70% of the rest are from former USSR countries. According to the same report visitors overwhelmingly came from Russia (46%), Georgia (27%), Iran (7%), Ukraine (2.4%), Germany (2%) and USA as of 2013. [32]

According National Statistical Service of the RA January-September 2016 report tourists who stayed in hotels came from Russia 19.2%, Iran 18.2%, US 10% , Germany 6.6%, France 5.6%, Georgia 3%, Ukraine 2.2% in 2016. As one will notice, the numbers are not aligning.[33] The reasons are mainly because one presents all visitors entered the country having big proportion of Armenians left for outreach work and the other shows the ones stayed at hotels,

[32] USAID Enterprise Development and Market Competitiveness - Armenian 2013 International Visitor Survey: Descriptive Analysis

[33] National Statistical Service of the RA, (http://www.armstat.am/am/)

which is more relevant to our study, as we are interested in foreign visitors' targeting. What is worrying is that compared to the previous years all percentages fell, but Iran (Annexes 7). On average one tourist spends $41.8 per day, and the average days spent in Armenia are 17.4 days. The 82.3% of tourists coming to Armenia visit Yerevan, 13.6-12.3% Armavir, Gegharkunik and Kotayk, 8-7.1 Shirak and Tavush regions. The rest of the five regions have even less proportion of visitors, particularly Vayots Dzor has only 4.6%. Overnight stay in regions has the following pattern as of 2013: Yerevan 50%, Shirak 15%, Lori 8% and the rest 5-2%. Vayots Dzor has the least proportion: only 1%. It currently serves as a corridor to Syunik region where tourism infrastructure is considerably developed than in Vayots Dzor (Annexes 8a, 8b). [34] Though there are no statistical precise numbers how many tourists are passing through and visiting Vayots Dzor but the first number is at least 120000 (official number of Tatev ropeway tickets' sales to visitors) and the second 40000 as of 2016. However, according to Smithsonian institution's regional development professional Vahe Darbinyan currently the collective number of the overnight hosting capacity in the region is 250 beds and only 16 hotels around the region.

During the past several years a growing interest towards wine bars has developed in Armenia, particularly in Yerevan. More than 5 wine bars have been opened during this time, most of which are concentrated in the center of the capital Yerevan very recently with few in the regions. Although there is no formal study about the number of visits in those wine bars, but population's, especially youth's, social media activity indicates that such places of interest become more and more popular and attract domestic visitors from different social layers. According to inVino wine bar's manager Mariam Saghatelyan, the majority of tourists visiting the bar are Germans and Russians. Wine bars are contributing not only to education and sophistication of domestic consumers, but also provide tourists opportunity to get acquainted with Armenian wines.

Several tour-agencies offer 1-7 days Armenia-Georgia combined tours as well as tours within Armenia, such as Wine tours to Vayots Dzor, Armavir and Tavush (Ijevan) regions, visits to factories and bars wine bars or vinotherapy in wine spa & salons (Annexes 9).

Wine tourism has become particularly popular in parallel with reorganization of Voskevaz in 2004, the entrance of Armas in 2007. Armas, Voskevaz and Armenian Wine are conducting excursions commence with a tour of vineyards and orchards throughout the estate. Armas also hosts private and corporate events. Although reviews of Voskevaz and Armas on TripAdvisor are few but mostly those are positive ones (Annex 10).

Traditional wine factories also provide wine tours and tastings in the factories like Wine-Brandy factory of Ijevan or Ararat Wine-Brandy Factory in Yerevan. In Vayots Dzor region

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[34] Vine and wine foundation of Armenia, (http://vwfa.am/)

there are some small wine factories and two relatively big ones Areni and Hin Areni that conduct tours (35000 and 5000 visitors annually). However, as there is no rating system on wines, as part of wine tours tourists visit wineries that do not produce high quality wine and this influence their idea of Armenian wine in a negative way.

In 2016 the eighth wine fest had implemented in Areni region and around 26,000 people have visited it. In festival organizer Nune Manukyan's words the initiation of the fest has positive impact of wine cultures development in Armenia. The number of Bed & Breakfast services has increased and some of the cultivators decided to make their own wines instead of selling the grape. In this way they can sell it together with food to touristic groups in their home basements, tasting rooms.

Although tourism in Armenia has a potential to grow related infrastructures' conditions slow this growth, such as high flight costs, expensive hotels, poor condition of roads and internal transportation, weak marketing, etc.

6. RECOMMENDATIONS

Responsible body for the development of wine cluster. The following recommendations are pipe dreams without a body responsible for initiating cluster development projects and overseeing them. Recently founded Vine and Wine Foundation of Armenia (VWFA) has the potential to become this central figure in the cluster. However, to do this it should be representative of the whole cluster and have power and authority to influence it. The assumed operational model includes creation of united export and education strategies, combination of efforts for possible scale effects, in the meantime, avoidance of conflict of interest in the management of the foundation.

Fight with phylloxera. The phylloxera root feeding pest is a huge threat to the existence of the most valuable resource for Armenian winemakers: the native grape varieties.
Currently, the infected vineyards are being destroyed to fight the pest. This approach is not effective and leads to faster exemption of the native grape varieties.
We strongly recommend redirection of financial efforts from destroying the vineyard to subsidizing grafting on the resistant rootstocks. Moreover, additional financial resources may be attracted from other agricultural expenditures, as the grape growing and winemaking are prioritized in the Industrial Policy of the Republic of Armenia.
The strategy should be planned, managed and overseen by VWFA. This issue is of key importance and neglecting it will lead to total desertion of the vineyards and death of local wines in under 20 years.

Focus on wine education. The education is a big issue for the cluster, due to the inefficient

quantity of qualified and modern professionals in the field. We recommend two solutions for this problem: in-house education upgrade and relocation of some existing international educational fellowships to the purpose of the cluster.
Nowadays, ANAU is the only armenian university that provides higher education in the field. However, the program is joint for winemaking, grape growing and other fermentation technologies. We recommend to divide the Winemaking and Viticulture from other fermentation productions in the structure and curriculums and adjust them to correspond the demand of the employers and the international standards. The structure and curriculum of this program should be developed in collaboration with the cluster and international universities like UC Davis and Geisenheim University.
There are several entities providing fellowships for Armenian students to study abroad, like the Luys foundation. We recommend to relocate the purpose of few of these fellowships in favor of winemaking and viticultural programs in UC Davis and other international universities, with obligation on the student's side to return and work in the sector for a specified amount of time after getting the education (one fellowship for MBA studies in one of the top 10 universities can cover 4-5 fellowships in this area).

Appellation of origin and wine rating system. Appellation of origin is a legally defined and protected geographical indication used to identify where the grapes for a wine were grown alongside with other restrictions, such as grape variety, maximum grape yields, alcohol level, and other quality factors. Such appellations are necessary for the international competitiveness of Armenian wine, as the concept of terroir is one of the most important criteria for wine assessment.
The RA Law on Alcoholic Beverages on the Basis of Grape (2008) defines 9 larger regions in Armenia for grape cultivation, but does not prohibit cultivation of wine-grapes outside of those. Provided the different natural and climate conditions for viticulture in a region, the Law allows further separation to macro-regions and micro-regions. The names and borders of the macro-regions and micro-regions are not yet defined.
Existence of such smaller regions has the potential to become the basis for appellations of origin.
Steps are being taken in this direction by the Government, however, apart from setting strict regulations, strict oversight should also be implemented. We see VWFA as the initiation and management body of the concept.

Specialized wine marketing. As international marketing and recognition of Armenian wine is an issue for almost all wine producers, presence of wine-specialized marketing specialists is critical for the cluster. We recommend that an experienced wine marketing specialist be invited by VWFA, who, will be engaged in two activities; first, it will organize trainings and internships for interested Marketing students and professionals, and second, the wine producers can hire the specialist to assist them with their marketing strategy. The center for these trainings and internships can be both the VWFA, and EVN Wine Academy. As a result in a couple of years we will have several local wine marketing specialists, who will work for the cluster and will be able to provide sufficient education for the younger generation.

Statistical data collection and storage. An important issue when analyzing the cluster is the lack of trustworthy statistical data on grape growing, winemaking and wine tourism in Armenia. Several researches have been conducted in the sphere, but the availability of broader information would allow to make deeper analysis for all the cluster participants, both for governmental bodies, and private investors.

Focus on wine tourism. Apart from taking steps in development of tourism in general, specific steps should be taken by both public and private sectors in development of wine tourism, in particular. These steps can include regulation of wine tours' quality, development of wine tourism routes, development of applications and resources that would provide information on wine attractions in Armenia, would allow to map your future routes and find guides, etc.

The development of wine tourism may be fostered by foundation of a private wine chateau. This idea is further discussed in the next chapter of this report.

The abovementioned recommendations are of the highest priority, being the first steps, necessary for the cluster development. The further steps include the laboratories modernization, modern anti-hail and irrigation technologies installation, encouragement of wine related research and publications, regulation of homemade wines quality and sales.

II. WINE CHATEAU FINANCIAL MODEL

Wine cluster development in Armenia, and in Areni region in particular, requires solid accommodation, and touristic entertainment centers, in order to make the tourist stay. For this purpose, establishment of a Wine Château in Areni Region is recommended. (Annexes 11-13) The Château will consist of fine vineyard, a winery, a hotel, and entertainment centers. The initial investment to the project is estimated to be ~2mln USD, which will generate positive cash flows in the 4th year of operations. The investment will cover the establishment of vineyard, construction of winery, hotel and auxiliary facilities.

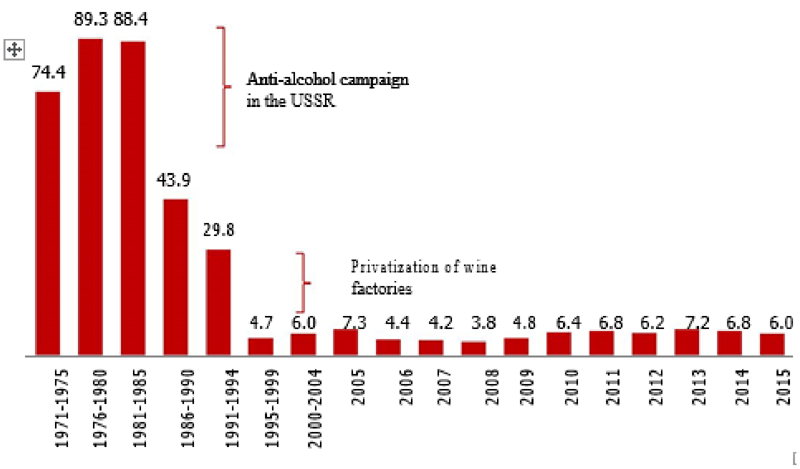
Based on the specifications of Areni grapes, the yield from 1ha of land is estimated as 5.5 tons. Around 1.0875 kg of grapes is required to make a bottle of wine (0.75 liters).

Besides the wines produced in the winery, Wine Château will also generate profit from sales of other high-quality wines in the wine shop, revenue from restaurant, hotel, and entertainment services, like spa, tours, hiking, wine tasting courses, etc.

The feasibility factors for the Wine Château operations are partnership with local wineries, public and private initiatives, organization of local wine-tasting events, participation in festivals and international events of both wine and tourism sectors. The value proposition of the Wine Château will be filling the lack of high-quality hospitality options for thousands of tourists who make the way from Yerevan southern regions of Armenia, also, increase of interest in wine and wine literacy by enabling a personalized wine experience.

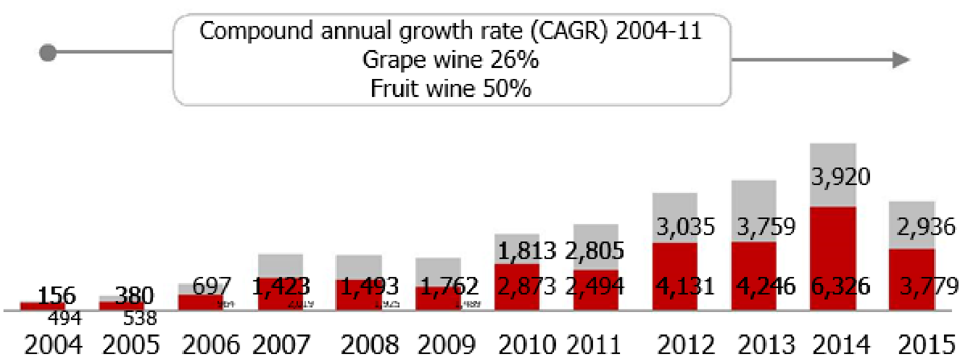
ANNEXES

Annex 1: Wine Production in Armenia (including fruit and sparkling wines), in million liters, 1971-2011



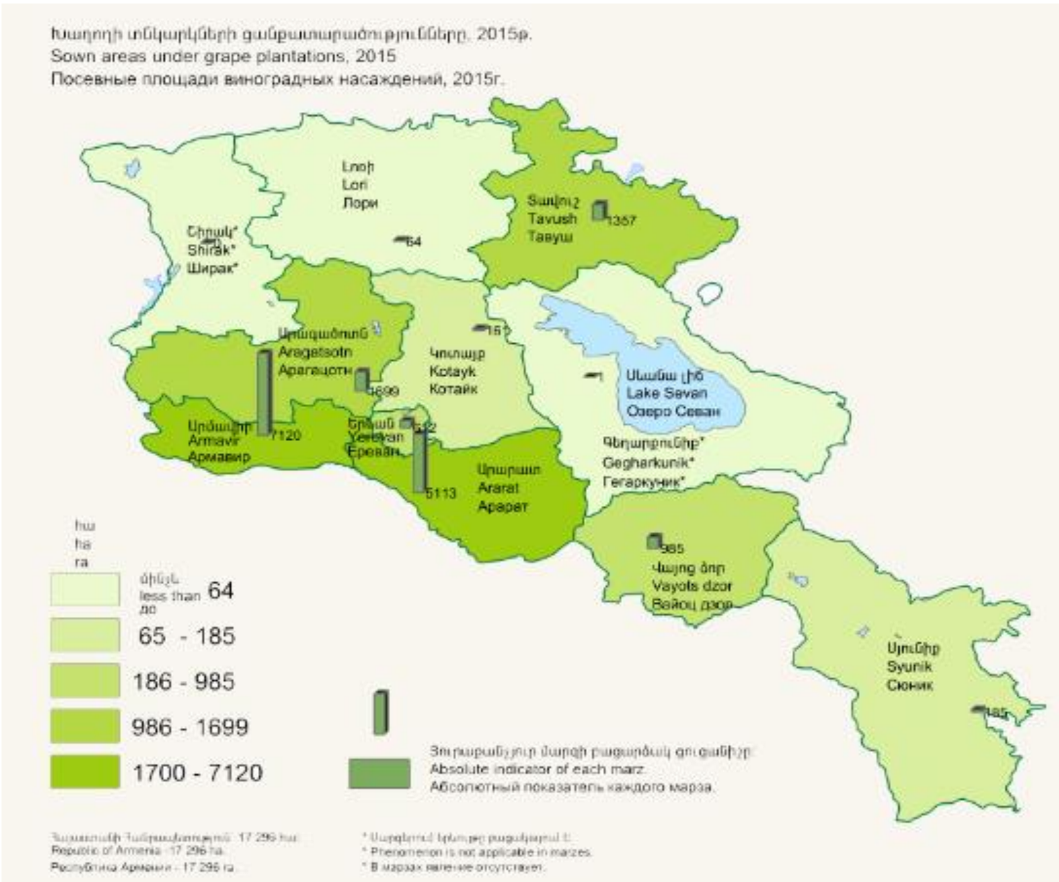
Source: National Statistical Service of Armenia

Annex 2: Grape and fruit wine export, in thousand USD



Source: UN ComTrade Database

Annex 3a: Sown areas under grape plantations, 2015



Source: Vine and wine foundation of Armenia (http://vwfa.am/?p=206&lang_id=1)

Annex 3b: Distribution of vineyard territories in Armenia by region

Marz	Share, %	Ha (2015)	Change, ha (2015 over 2010-2012 average
Armavir	41%	7,120	28
Ararat	30%	5,113	115
Aragatsotn	10%	1,699	228
Tavush	8%	1,357	9
Vayots Dzor	6%	985	81
Yerevan	4%	612	-
Syunik	1%	185	-
Kotayk	1%	161	-190
Lori	0.4%	64	-

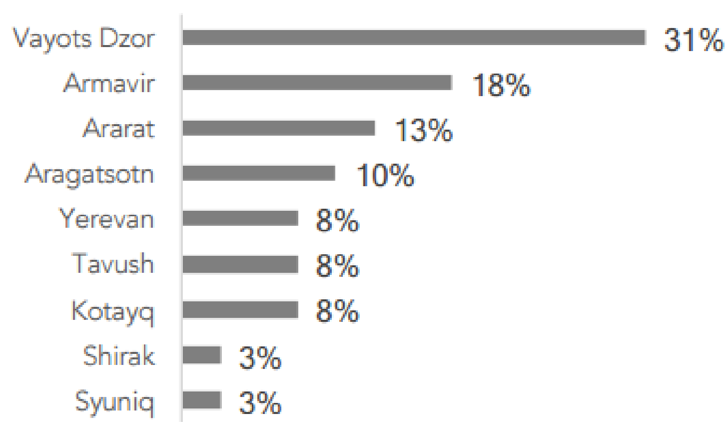
Source: National Statistical Service of Armenia

Annex 3c: Planting areas of grape and average yield capacity by regions, 2015

	Տարածությունները, հա Sown areas (ha)					Բերքատվությունը, ց/հա Yield capacity (centner/ha)				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
REPUBLIC OF ARMENIA	16 288	17 415	17 465	17 215	17 296	158	151.3	149.8	157.7	188.2
YEREVAN CITY	612	612	612	612	612	65.4	67	68.6	78.4	94.8
ARAGATSOTN	1 148	1 694	1 698	1 699	1 699	107.8	88	87.1	92.4	106.5
ARARAT	4 881	5 120	5 143	5 083	5 113	204.2	199.4	211.3	218.8	250.4
ARMAVIR	6 863	7 033	7 136	7 119	7 120	183.5	176.2	156.6	167.2	211.5
GEGHARKUNIK	-	1	1	1	-	-	20	0	0	-
LORI	64	64	64	64	64	20.3	25.8	34	55.4	29
KOTAYK	290	403	336	161	161	17.2	17.1	26.8	21.9	51.2
SYUNIK	185	185	185	185	185	50.5	62.1	64.4	64.6	65.4
VAYOTS DZOR	889	928	935	935	985	51	49.8	58.4	55.8	58.7
TAVUSH	1 356	1 375	1 355	1 356	1 357	98.6	97.2	107.5	108.4	125.5

Source: Vine and wine foundation of Armenia (http://vwfa.am/?p=206&lang_id=1)

Annex 4a: Distribution of winemaking companies in Armenia by region



Source: National Statistical Service of Armenia

Annex 4b: Map of winemaking companies in Armenia, 2015

Annex 5: Armenian Grape Wine Exports in 2016 (Top 30 Countries by Value)

	Export Country	Trade Value (US$)	Quantity (liters)	Value in Export per Liter (US$)
1	Russian Federation	4,493,317.00	1,472,663	3.05
2	USA	339,913.00	74,019	4.59
3	Lithuania	93,329.00	27,986	3.33
4	Italy	91,190.00	15,534	5.87
5	Ukraine	85,907.00	37,046	2.32
6	France	76,045.00	12,470	6.10
7	Switzerland	68,879.00	48,970	1.41
8	Belgium	49,907.00	9,670	5.16
9	Netherlands	49,622.00	7,932	6.26
10	Sweden	44,333.00	5,694	7.79
11	Czech Republic	43,969.00	5,814	7.56
12	Belarus	43,615.00	9,999	4.36
13	United Kingdom	37,733.00	5,456	6.92
14	Georgia	36,228.00	24,671	1.47
15	Germany	31,067.00	5,224	5.95
16	Latvia	26,396.00	9,383	2.81
17	Japan	24,400.00	2,952	8.27
18	Poland	22,218.00	7,163	3.10
19	China	20,372.00	8,039	2.53
20	Estonia	20,140.00	4,015	5.02
21	Canada	18,367.00	2,246	8.18
22	Mexico	13,202.00	999	13.22
23	Lebanon	10,939.00	3,028	3.61
24	Bulgaria	8,461.00	2,043	4.14
25	Israel	911.00	216	4.22
26	India	169.00	127	1.33
27	China, Hong Kong SAR	162.00	58	2.79
28	Spain	74.00	18	4.11
29	Philippines	50.00	6	8.33
30	United Arab Emirates	22.00	7	3.14

Source: UN Comtrade Database (https://comtrade.un.org/data/)

Annex 6: List of Services Provided by Semina Consulting

Viticulture and Agronomy	**Enology and Wineries**	**Sales and Marketing**
Viticulture Consulting	Winemaking Consulting	Sales of Winery Equipment
Site Selection	Services of City Pad Winery	Sales of Winery Services
Soil Analysis	Winery Design	Sales of Wines
Varietal Selection	Winery Architecture	Wine Label and Packaging Design
Vineyard Planting	Winery Automation	Wine Branding and Market Positioning
Drip Irrigation System Installation	Winery Engineering	Strategic Marketing
Vineyard Management		Sales and Distribution

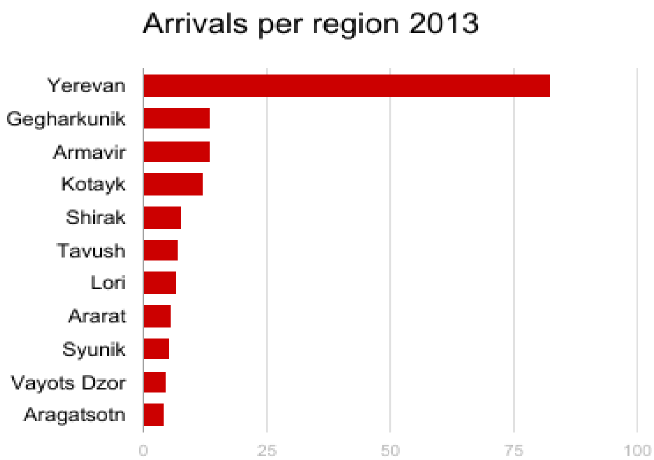
Annex 7: Tourists' country of residency coming to Armenia, 2006-2016

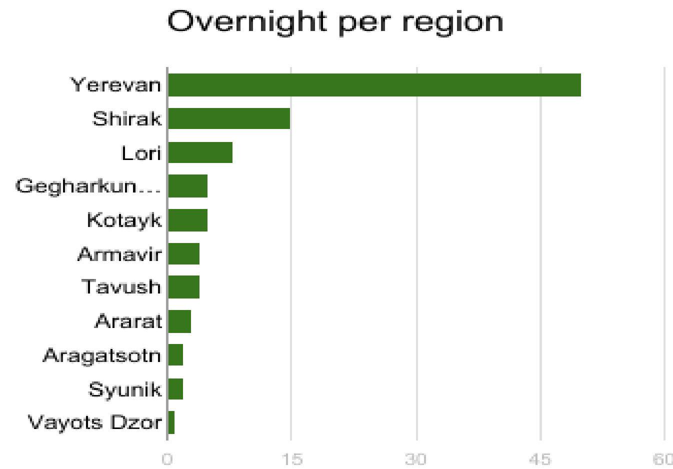
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Russia	17%	17.10%	17.60%	15.70%	17.10%	15.70%	17.20%	21.80%	23.00%	21.50%	19.20%
Georgia	4%	4.10%	5.20%	3.70%	3.30%	2.30%	2.60%	2.60%	2.90%	2.50%	3.00%
Iran	5.40%	5.00%	6.00%	8.90%	10.90%	8.00%	7.40%	5.90%	7.10%	10.50%	18.20%
US	23.30%	21.80%	17.30%	18.20%	14.50%	15.00%	13.10%	12.30%	12.70%	15.40%	10.30%
EU	34.50%	37.90%	38.50%	38.40%	30.20%	39.30%	39.40%	37.20%	33.90%	26.90%	26.70%
Other							20.30%	20.20%	20.40%	23.20%	22.60%

Source: National Statistical Service of Armenia

Annexes 8a, 8b: Incoming tourists' visit and stay in regions.

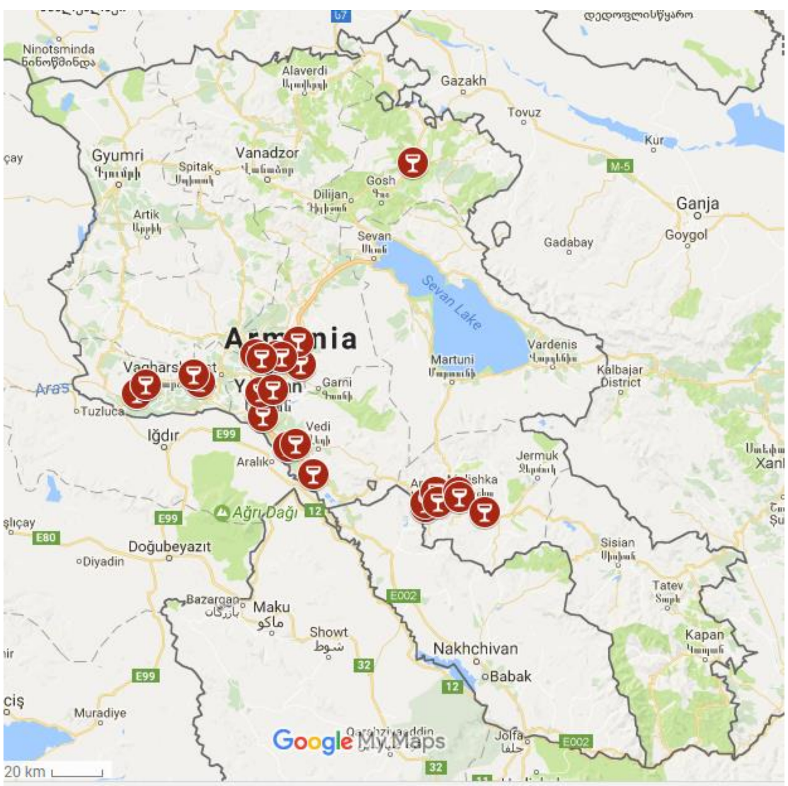
a. **b.**





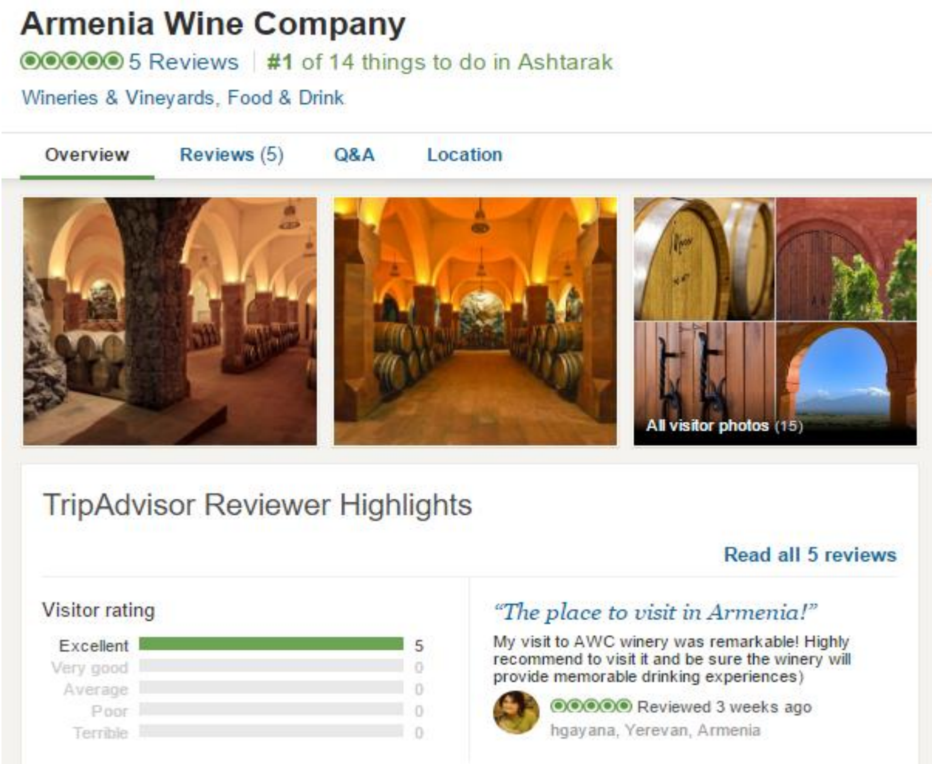
Source: USAID Enterprise Development and Market Competitiveness descriptive analysis

Annex 9: Wine Tourism Map



Source: USAID Enterprise Development and Market Competitiveness descriptive analysis

Annex 10: Screenshots of Armenia Wine Company and Golden Grape Armas Estate TripAdvisor Pages



Golden Grape Armas Estate

19 Reviews | **#1** of 1 things to do in Nor Yedesia

Wine Tours & Tastings , Wineries & Vineyards, Tours, Food & Drink

Overview | Reviews (19) | Q&A | Location

TripAdvisor Reviewer Highlights

Read all 19 reviews

Visitor rating

Excellent	16
Very good	0
Average	0
Poor	0
Terrible	1

"Fantastic place"

I have been here a week ago with my friends from Italy. I just want to require you to visit ArmAs as this is just heaven. It is a picturesque display of agricultural achievement... read more

Reviewed August 2, 2016

Annex 11: Areni Wine Chateau Establishment costs

11a. Vineyard complex establishment costs	Start up Value $
LAND	
Purchase Price:	$8,000
WATER COST	
Dam Construction:	$0
Water Right/Allocation:	$1,695
Irrigation Infrastructure (pipes, pumps, drippers etc.):	$9,000
Frost System Infrastructure (pipes, pumps, sprinklers etc.):	$11,000
Soil moisture monitoring equip	$300
PREPARATION	
Soil Survey	$300
Drainage works	$200
Trellis	$8,000
Fertilizers	$1,000
Deep Ripping	$600
Soil Preparation	$800
PLANTING	
Planting (labour)	$2,000
Planting (rootstock)	$3,000
OTHER	
Sheds/Amenities	$1,500
Windbreaks	$50
Roadworks/Laneways	$300
Basic Machinery/Tools	$1,000
TOTALS	**48,745**

11b. Winery construction costs	
Required area, sq.m	$500
Land purchase cost	$5,000
Facility Construction	$250,000
Equipment	
Purveyance weights	$3,000
Wine Tanks	$10,000
Crusher Destemmer	$3,000
Wine Presses	$5,000
Grape Sorting/vibrating tables	$1,500

Fermentation equipment, tanks	$1,500
Grape Stalk Crusher	$1,500
Wine Pumps	$1,500
Wine Filtration	$1,500
Punch Downs (Manual or Pneumatic)	$1,500
Celler	$15,000
Bottling Equipment	$1,500
Corkers	$1,500
Refrigeration system	$15,000
TOTALS	**$48,000**

Hotel and Tasting Complex establishment costs

HOTEL	$1,680,000
RESTAURANT	$150,000
AUX BUILDINGS	$23,500
CONNECTIVITY	$4,500
TOTALS	**$1,858,000**
GRAND TOTAL	**$1,954,745**

Annex 12: Areni Wine Chateau Forecasted Financial Statements

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Income Statement, $										
Revenue from sales of products, goods, works and services	-	-	284,104	751,048	1,141,968	1,373,397	1,419,559	1,520,001	1,603,892	1,689,955
Cost of prod.,goods sold,works,services provided	(92,304)	(92,304)	(277,135)	(482,336)	(545,825)	(610,031)	(651,608)	(715,457)	(736,923)	(760,344)
Gross profit (loss)	**(92,304)**	**(92,304)**	**6,968**	**268,712**	**596,143**	**763,365**	**767,952**	**804,544**	**866,969**	**929,611**
Gross margin, %			*2%*	*36%*	*52%*	*56%*	*54%*	*53%*	*54%*	*55%*
SGA	-	-	**(42,616)**	**(112,657)**	**(171,295)**	**(206,010)**	**(212,934)**	**(228,000)**	**(240,584)**	**(253,493)**
Other (loss) / Income	-	-	**(14,205)**	**(37,552)**	**(57,098)**	**(68,670)**	**(70,978)**	**(76,000)**	**(80,195)**	**(84,498)**
EBITDA	**(92,304)**	**(92,304)**	**(49,852)**	**118,503**	**367,750**	**488,686**	**484,040**	**500,544**	**546,190**	**591,620**
EBITDA margin, %			-18%	16%	32%	36%	34%	33%	34%	35%
Depreciation and amortization of Fixed assets	-	-	(48,869)	(48,869)	(48,869)	(48,869)	(48,869)	(48,869)	(48,869)	(48,869)
interest expense	-	-	(77,538)	(73,231)	(69,162)	(65,320)	(61,691)	(58,264)	(55,027)	(51,970)
EBT	**(92,304)**	**(92,304)**	**(176,259)**	**(3,597)**	**249,719**	**374,498**	**373,480**	**393,411**	**442,295**	**490,781**
Tax expense	-	-	-	-	49,944	74,900	74,696	78,682	88,459	98,156
Net Income	**(92,304)**	**(92,304)**	**(176,259)**	**(3,597)**	**299,662**	**449,397**	**448,176**	**472,094**	**530,754**	**588,938**
Net Income Margin, %			*-62%*	*0%*	*26%*	*33%*	*32%*	*31%*	*33%*	*35%*

Statement of Financial Position, $	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
ASSETS										
Non-current assets	**1,954,745**	**1,954,745**	**1,905,876**	**1,857,008**	**1,808,139**	**1,759,271**	**1,710,402**	**1,661,533**	**1,612,665**	**1,563,796**
Current assets										
Inventories	(22,760)	(22,760)	68,335	118,932	134,587	150,419	160,670	176,414	181,707	187,482
Trade and other receivables	-	-	46,702	123,460	187,721	225,764	233,352	249,863	263,653	277,801
Cash and bank balances	(69,547)	(161,851)	(391,279)	(453,534)	(198,324)	234,454	697,990	1,177,960	1,720,672	2,322,495
Total current assets	**(92,307)**	**(184,610)**	**(276,242)**	**(211,142)**	**123,984**	**610,636**	**1,092,012**	**1,604,238**	**2,166,033**	**2,787,778**
Total assets	**1,862,438**	**1,770,135**	**1,629,634**	**1,645,866**	**1,932,123**	**2,369,907**	**2,802,414**	**3,265,771**	**3,778,697**	**4,351,574**
EQUITY AND LIABILITIES										
Equity										
Share capital	1,368,322	1,368,322	1,368,322	1,368,322	1,368,322	1,368,322	1,368,322	1,368,322	1,368,322	1,368,322
Retained earnings	(92,304)	(184,608)	(360,867)	(364,463)	(64,801)	384,596	832,773	1,304,866	1,835,620	2,424,558
Total equity	**1,276,018**	**1,183,714**	**1,007,455**	**1,003,858**	**1,303,521**	**1,752,918**	**2,201,094**	**2,673,188**	**3,203,942**	**3,792,879**
Liabilities										
Non-current liabilities										
Received long-term borrowings	586,424	586,424	553,844	523,075	494,016	466,570	440,650	416,169	393,049	371,213
Total non-current liabilities	**586,424**	**586,424**	**553,844**	**523,075**	**494,016**	**466,570**	**440,650**	**416,169**	**393,049**	**371,213**
Current liabilities										
Trade and other payables	(3)	(3)	68,335	118,932	134,587	150,419	160,670	176,414	181,707	187,482
Total current liabilities	**(3)**	**(3)**	**68,335**	**118,932**	**134,587**	**150,419**	**160,670**	**176,414**	**181,707**	**187,482**
Total liabilities	**586,421**	**586,421**	**622,179**	**642,007**	**628,602**	**616,989**	**601,320**	**592,583**	**574,756**	**558,695**
Total equity and liabilities	**1,862,438**	**1,770,135**	**1,629,634**	**1,645,866**	**1,932,123**	**2,369,907**	**2,802,414**	**3,265,771**	**3,778,697**	**4,351,574**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Statement of Cash Flows, $										
Begiinning Balance										
Net Income	(92,304)	(92,304)	(176,259)	(3,597)	299,662	449,397	448,176	472,094	530,754	588,938
Adjustments for:										
Depreciation	-	-	48,869	48,869	48,869	48,869	48,869	48,869	48,869	48,869
interest expense	-	-	77,538	73,231	69,162	65,320	61,691	58,264	55,027	51,970
Changes in:										
Receivables	-	-	(46,702)	(76,758)	(64,261)	(38,043)	(7,588)	(16,511)	(13,790)	(14,147)
Payables	(3)	-	68,338	50,597	15,655	15,832	10,252	15,744	5,293	5,775
Inventories	22,760	-	(91,095)	(50,597)	(15,655)	(15,832)	(10,252)	(15,744)	(5,293)	(5,775)
Cash flows from operating activities	**(69,547)**	**(92,304)**	**(119,311)**	**41,745**	**353,433**	**525,543**	**551,148**	**562,715**	**620,859**	**675,629**
CAPEX	(1,954,745)	-	-	-	-	-	-	-	-	-
Cash flows from investing activities	**(1,954,745)**	-	-	-	-	-	-	-	-	-
Free cash flow	**(2,024,292)**	**(92,304)**	**(119,311)**	**41,745**	**353,433**	**525,543**	**551,148**	**562,715**	**620,859**	**675,629**
increase in share capital	1,368,322	-	-	-	-	-	-	-	-	-
inflows from loans	586,424	-	-	-	-	-	-	-	-	-
repayment	-	-	(32,579)	(30,769)	(29,060)	(27,445)	(25,921)	(24,481)	(23,121)	(21,836)
interest expense	-	-	(77,538)	(73,231)	(69,162)	(65,320)	(61,691)	(58,264)	(55,027)	(51,970)
Cash flows from Financing Activities	**1,954,745**	-	**(110,117)**	**(104,000)**	**(98,222)**	**(92,765)**	**(87,612)**	**(82,744)**	**(78,147)**	**(73,806)**
Opening Balance	-	(69,547)	(161,851)	(391,279)	(453,534)	(198,324)	234,454	697,990	1,177,960	1,720,672
Changes in cash	(69,547)	(92,304)	(229,429)	(62,255)	255,211	432,777	463,536	479,971	542,712	601,823
Ending Balance	**(69,547)**	**(161,851)**	**(391,279)**	**(453,534)**	**(198,324)**	**234,454**	**697,990**	**1,177,960**	**1,720,672**	**2,322,495**

Annex 13: Areni Wine Chateau Valuation Base and Valuation

Assumptions and adjustments for WACC	
Risk Free Rate (20-year government bond spot rate)	12.63%
Moody's Sovereign Rating for Armenia	B1
Rating Based Default Spread For Armenia	5.20%
Current Risk Premium For a Developed Equity Market	5.69%
Multiplier for Equity Market Volatility Adjustment	1.23
Equity Risk Premium	12.09%
Required Return on Equity	**24.71%**
Cost of debt	14.0%
Tax rate	20%
After-tax cost of debt	11.2%
weight of debt	70%
weight of equity	30%
WACC (real rate)	**15.3%**

LT growth rate	0.10%										
Value of: Current facility operations											
	000's USD	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
FCFF		(2,024,292)	(92,304)	(119,311)	41,745	353,433	525,543	551,148	562,715	620,859	675,629
Terminal value											4,463,066
FCFF - NPV	(760,958)										
Terminal value - NPV	3,872,395										
Enterprise value, USD	**3,111,437**										
IRR	16.56%										