Research Paper

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The Retrospective Image of Vine Distribution on the Back-ground of Samtskhe-Javakheti

Geography

KEYWORDS : Vine, artificial terraces, terrace viticulture, Samtskhe-Javakheti.

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ABSTRACT

Study of certain issues of natural management is quite significant for many reasons. In this point of view it's very important to learn about the traditional knowledge and experience, which enabled the population having economic profit in the past and the effective use of which is also possible nowadays. This would lead to sustainable ecologic development. In the past, in Samtskhe-Javakheti viticulture was a dominant branch together with wheat farming and fruit growing in agriculture. However, due to the historical processes viticulture nearly died out here. Investigations showed that here vine mainly grew together with fruit in artificial terraces with stone walls. The terraces were arranged in the gorges of the river Mtkvari and its numerous tribu-taries, since vine required irrigating due to the local climatic conditions.

For the research numerous sources have been used – historical, toponymic, ampelographic, cartographic, the analyses of which determined that in the past vine covered comparably more area on the territory of Samtskhe-Javakheti, especially Samtskhe. The study is also based on field investigations, during which by means of observations and inquiries we collected useful information. We determined that nowadays only fragments of the terrace viticulture have survived here and its restora-tion is possible.

1. Introduction

Besides cognitive, the study of traditional forms of nature management has practical use, since the centuries' experiences of land farming is useful even in our industrial epoch as well. Thus, the study of separate issues of nature management is significant as far as we obtain a detailed image of the human-nature interrelation – what we, humans use and how on the one hand and on the other hand how we protect or damage it. Samtskhe-Javakheti is not an exception regarding this issue. This tradition teaches us not only the optimal way of harvest reaping but also the best form of the nature protection. Samtskhe-Javakheti, especially Samtskhe (the western part of the region) and Tori (the north-eastern part of the region) are rich in such experience, though we cannot say the same about Javakheti (the eastern part of the region).

Samtskhe-Javakheti is located in the southern part of Georgia. It covers 6413 km^2 area. It is characterized with various natural conditions and resources. However, the irrational use of the natural resources delays the economic development of not only this region. The most part of the region is either insignificantly changed or completely untouched by human hand. This natural wealth is less studied and its ecological function is underestimated. Samtskhe-Javakheti is known for its tourism and recreation potential; prospects of development of transboundary tourism, formation of protected areas of arid zones and wetlands; possibility of cultivation of lands for natural food production necessary for stockbreeding, and etc. Therefore, the region attracts special attention regarding its social and economic development.

Samtskhe-Javakheti is mainly an agricultural region. The agricultural land covers more than 2/3 of the whole supply of land and the most of the population is involved in agriculture. It is one of the regions of Georgia, where stockbreeding is the leading sector of agriculture. The industry here is characterized with very limited branches. Here, agriculture and firstly viticulture, together with wheat farming and fruit growing have been mainly developed. However, the historical processes followed by settlements of the people, whose culture was quite different from the local population and who lead quite different way of life than the Georgians, became the reason for almost dying out of viticulture here. These circumstances are the additional factor for studying the issue.

There is just little information about wide spread of vine and its numerous cultivars here. However, we will be able to convincingly speak about it if we refer to various sources like toponyms, artificial terraces, old historical documents, the rich vocabulary of the region regarding vine and wine and the analysis of the peculiarities of relevant medium for viticulture development. According exactly to this valuable information we may prove more – viticulture has been quite advanced branch in the region.

We used numerous sources for the research – historical, toponymic, ampelographic and cartographic, on the basis of which it became known that viticulture covered more area in the past in Samtskhe-Javakheti, especially in Samtskhe. The work is also based on field investigations, during which quite useful and relevant information has been collected by observation and inquiries. We used the information obtained by observations and inquiries in 2014 during the field investigations.

It is determined that nowadays only fragments of the terrace viticulture have survived in the region, though it is quite restorable.

The goal of the research is to create the retrospective Image of vine distribution of Samtskhe-Javakheti on the base of different sources.

2. Research Methods and Initial Data

For the research numerous sources have been used – historical, toponymic, ampelographic, cartographic, the analyses of which determined that in the past vine covered comparably more area on the territory of Samtskhe-Javakheti, especially Samtskhe. The study is also based on field investigations, during which by means of observations and inquiries we collected useful information. All these materials were gathered, systematized and analyzed. Total 34 field descriptions were filled in, 25 terraces were described and 19 local people were interviewed. The field studies allowed generalizing the data found in special literary sources and evaluating the retrospective imaging and the state of the present-day viticulture in the region.

The viticulture data, amassed by branch geographical, ampelo-

graphic, historical literature, is scattered in various scientific-research organizations, also different approaches and techniques pose difficulties in their comparison. In this regard, data systematization and creation of integrated database is very important.

3. Study Area

Samtskhe-Javakheti is one of the administrative unit - region ("Mkhare") located in the south of Georgia. It's an agrarian region and also historically, agriculture played a significant role in the development of this region. The agriculture remains a leading branch in here. Samtskhe-Javakheti has rich natural agricultural resources [Jaoshvili, 1996]. Agricultural lands make up more than 2/3 of all lands in the region and the major part of local population is involved in agriculture. Pastures have the greatest proportion of the land fund - almost 70% of whole area. So, that's one of the regions of Georgia where animal husbandry is the leading branch of agriculture. Industry is limited to only several spheres.

Samtskhe-Javakheti, located within the hypsometric range of 700-3300 m above sea level, by considering the vertical zoning, is distinguished for a strongly split relief and diversified climatic and soil conditions. All this supports the development of different branches of agriculture, starting from vine-growing and gardening through cattle-breeding, and determines the specialization of different regions in some type of agricultural crops [Sartania, 2015].

Samtkhe-Javakheti has unique natural conditions. The great part of its territory has relatively high percent not changed or less changed ecosystems. This natural peculiarities and also the distribution of vine in historical periods are not sufficient studied, also is not interpreted those ecological and economical functions which this regions can play in the socio-economical development of Georgia.

The main physico-geographical and socio-economical features of region are:

- high level of bio- and landscape diversity. There are 1,400-1,500 varieties of plants. There are arid, semiarid, semihumid, transitional semihumid, humid and extra-humid landscapes with steppes, thorny plants, deciduous and coniferous forests, swamp plants, sub-alpine and alpine meadows;
- a high share of virgin landscapes;
- uneven territorial and seasonal distribution of water resources, which creates problems with access to water and its irrational use
- abundance of mineral sources with different chemical composition and high medical importance;
- ethnic-religious and cultural diversity, which determines different forms of nature use;
- a great number of architectural monuments;
- a great number of touristic and recreational objects;
- etc.

Samtkhe-Javakheti is perspective in the different attitude: developing of tourism and recreation, transboundary tourism, also developing of arid zone and wetland places protected areas system, existing here pastures are large potential for developing of cattle-breeding, etc. In consideration of those prospects particular emphasis is made on working out socio-economic development plan. Tbilisi-Karsi trunk railway construction as well as construction of hydroelectric power station in the nearest future is the confirmation.

4. Main Results

4.1. Analysis of old sources

In the past vine was widely spread in the territory of Meskheti. It was grown in the territories of modern Samtskhe and Javakheti, also on the rest area of historical Meskheti, i.e. Artaani, Kola and Erusheti (nowadays in Turkey). This is mentioned in many sources [Javakhishvili, 1930; Vakhushti Bagrationi, 1941; Ketskhoveli, 1954, 1955; 1957; Ketskhoveli, Ramishvili, Tabidze, 1960; Proneli, 1991, etc.].

Some authors clearly distinguish vertical zonality in Samtskhe-Javalketi [Beriashvili, 1989; Ukleba, 1964; Beruchashvili, 1979; Ukleba, 1983]. Here several vertical zones / landscapes are distinguished. Among these vertical zones of Samtskhe-Javakheti, regarding the development of viticulture, the mountain depression landscapes up to 1200-1300 m msl (mean sea level) are named. These areas are presented as hilly erosive relief and mainly mild forms of landscape. Here, on the low slopes of the ravines some terraces are arranged, where autumn varieties predominate among wheat species. Historically this zone was distinguished for its developed viticulture and wine production. There were various aboriginal vine cultivars, which had well adjusted to the local mountain climate conditions and were known for their high yielding [Beriashvili, 1989].

Many scientists have made efforts to find out the reason for dying out viticulture as a branch of agriculture in Meskheti. In most cases they mainly name the political processes in the region as the main factor.

"The map of botanical and agronomical areas of Georgia according to old sources" edited by Iv. Javakhishvili also proves that on the territory of Meskheti the areas with vine and fruit gardens covered only the Akhaltsikhe depression in Samtskhe. Hereby, Iv. Javakhishvili marks that in Meskheti the decrease of vine areas and its full annihilation at some places had taken place and this was the result of the historical processes that were occurring during centuries in Georgia – raids of enemy, massacre and deportation of the local population, collapse in the agriculture. According to the above mentioned data viticulture had survived till the XIX century here but not at the same extent as in the earlier past.

The fact that viticulture was widely spread in Samtskhe is undutiful, though it is somehow arguable about Javakheti. However, viticulture must have been developed at some extent in this region of Georgia as well, but not all over its whole territory.

"*The Great Book of Vilayet* (ottoman word for a district) *of Gurji*stan (ottoman name for Georgia)" represents one of the documents among those, which confirm the existence of vine on the territory of Meskheti [The Great Book of Vilayet of Gurjistan, 1941]. There are mentioned many villages in this document. According to it not only the population of the Samtskhe villages but the inhabitants of Javakheti also had to pay the tax for their vineyards. It is also noteworthy that the tax for vine and sweet juice was pretty high in some *liva*s. By N. Ketskhoveli's calculation the tax for fruit juice was fixed in eight *liva*s and the highest taxes were in the *liva*s of Panavi and Akhaltsikhe.

The fact that viticulture was well developed in the past in Tori and Meskheti is clear. However, we cannot prove the same about Javakheti, though viticulture was also spread in this region as well but did not cover its whole territory. According to one of historical sources vine was met in the district of Akhalkalaki: "According to Ballas, in 1895 in the district of Akhaltsikhe there were only 10 vineyards covering the area of 3 dessiatines, in the district of Akhalkalaki – 3 dessiatines (Russian)" [Beridze, 1965].

Development of viticulture in Meskheti was supported not only by the environmental conditions but the historical conditions of social and economic development of the region as well.

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4.2. Vine in terraces

According to the archaeological material and historical sources, also on the basis of the analysis of field investigations by specialists of various branches we may make obvious the great tradition of the region in vine planting, its agro-technique and launching and consumption of vine products. This is also proved by lexical material and toponyms. The study also showed that vine was mainly grown together with fruit in artificial terraces with stone walls. The terraces were built in the gorges of the river Mtkvari and its numerous tributaries, since due to the local climate conditions the vine required irrigating.

Ivane Javakhishvili paid great attention to the study of the history of the economic development of the country. He considers cultivation of wild plants and domesticating of animals as a part of the culture of the society "*The study of all these issues widens and deepens the history of the human culture.*" [Javakhishvili, 1986, p.12]. This quotation is referred to historical Meskheti, a region with highly developed agriculture. The attempts of the enemy to damage the system of the Georgian nation by annihilating the viticulture, mentioned above by Iv. Javakhishvili, ruined this region as well. Such interferences could not pass without consequences and their results are seen even nowadays. Therefore, the study of the viticulture in Meskheti has historical and economic values. Rational and effective economic arrangement of the region will become possible if taken into account the traditions existent in the past.

Due to the difficult orographic conditions vine was mainly spread in artificial terraces in Meskheti. Besides, building terraces on the slopes of southern exposition was one of the best means to use the solar energy.

4.3. Orographic conditions

Meskheti is known for different, specific physical-geographic conditions that had influence on the sectors of agriculture and the peculiarities of the viticulture and wine-making. In the physical-geographical view point it is represented with two main, quite different regions: Samtskhe and Tori characterized with hilly relief surrounded by high mountain systems and Javakheti, represented as a high, vast plateau.

Generally, compared to other viticulture regions of Georgia it is known for its severe conditions, though we may not say it flatly. Samtskhe and Tori have more favourable conditions for viticulture development than the plateau of Javakheti. It was also proved historically – Samtskhe became the main area for vine growth.

The orographic barriers, large hypsometric diapason, alternation of mountains and gorges, depressions and mountain plateaus have formed significantly contrasting climatic conditions. The contrasting difference bears influence on air temperature, atmospheric precipitations and other meteorological parameters. Samtskhe-Javakheti is very inhomogeneous in its relief. For the growth and vegetation of plants the soil fertility, climate, solar rays, the exposition and dampness of the soil are contemporaneously significant. Therefore, the Georgian farmers had different approaches to vine growing. They used a certain way for soil cultivation at those places, where the ground was even and used another way in comparably steep slope areas. In both cases the relief used for agricultural purposes had to be terraced in order to prevent the soil from washing away by the down-flowing water.

In Samtskhe-Javakheti we meet two kinds of terraces matched with the relief: the first one is so called ***lari*** and the other is ***darija***. The former is met on the slopes with less inclination. A *lari* was arranged on the slopes with 8-10° inclination surfaces. It was gained as a result of cross-wise ploughing of slopes. At the lower side the area did not have any walls for fencing off the soil, since due to the little inclination of the relief the *lari* did not need any walls. Besides, it was impossible to build wooden or stone walls for them due to their hugeness: for this purpose a great amount of building material would be required and the process would be labour-intensive. The situation was quite different in the case of *darija*. It was arranged on steep slopes along river gorges in order to use the river water for the soil irrigation.

The length and width of the *darija* was determined in accordance with the relief peculiarities. As L. Beriashvili says "the width of a typical terrace is 4-10 m and the length – 30-35 m" [Beriashvili, 1989]. According to N. Chijavadze in villages Khizabavra and Saro the *darijas* were made of 50-120 terraces and the height of the stone walls of the terraces was 2-5 m [Chijavadze, 1978].

A farmer used to start ploughing cross-wise at the bottom of the slope and gradually ploughed deeper and deeper. The higher the soil was located the deeper it was ploughed. Therefore, the soil on the slope would become flatter. Afterwards, the farmer would leave this place that had already become a terrace and start making a new terrace, i.e. a *lari*. Thus, several terraces were made according to the width of the slope. The width of each *lari* varied from 4-5 m to 20-30 m, whereas the length depended on the size of the slope [Sartania, 2015].

As a result of field investigations we have obtained a quite interesting image of the *darija*s in Khertvisi, where we can still see the survived terraces with stone walls and years-old plants and even some working tools like grape press. All the above said indicates that fruit-growing was well developed in the region. The *darija*s in Khertvisi were irrigated with the water from the river Paravani. The water flew along several hundred meters through a special channel made of stone to the vineyards and here it had switchers at the head of every terrace to run the water to it. The channel was constructed in such a way that the water flew from the highest terraces down to the lower ones.

Unfortunately, these unique *darija*s do not function in Khertvisi nowadays. As to *lari*s, they are still widely spread in Samtskhe-Javakheti, where the population grows wheat and potato. These products are highly requested. However, vine and fruit have lost their product characteristic and consequently, the *darija*s are left without function. This is the main reason for the state of the *darija*s in the region.

4.4. Correlation of heat and humidity

One of the most significant factors for vine growing is the peculiarities of correlation of thermal conditions and humidity. Absolute minimal temperature, the total amount of active temperatures, quantity of atmospheric precipitations, duration of solar light, wind direction and strength, duration of vegetation period, edaphic (soil type, quantity of humus) conditions and etc. are very important factors.

The highest yearly air temperature is observed in the Akhaltsikhe depression. According to the meteorological stations of Adigeni, Aspindza and Akhaltsikhe its average value is 8.0-9.4°C. At the Akhaltsikhe plateau, especially in its eastern part the temperature decreases to 1.8°C. The coldest average monthly temperature here is -8-10°C, and the absolute minimum is -38°C. These data make it obvious that the territory is not favourable for vine growing or even for early-season varieties. Therefore, we cannot suppose that in the past viticulture was widely spread in this area of Javakheti. However, we cannot exclude that the farmers used to burry vine underground in winter.

As to the north-western and western parts of the Akhalkalaki plateau that spreads up to 1200-1600 m msl the coldest average

monthly temperature is -5-6 °C, and the total amount of active temperatures is 2800. The frostless period lasts from the end of April including the first decade of October. This period of time is quite sufficient for growth of early- and mid-ripening varieties of vine. Therefore, it became quite possible to develop viticulture on the basis of terrace farming on southern exposition slopes in the villages of Apnia, Gogasheni, Vargavi, Saro, Khertvisi, Khizabavra, etc. Even in Apnia and Gogasheni, which are located over 1700 m msl in the extreme south among the populated villages it was possible to grow vine.

The seasonal distribution of atmospheric precipitations is not the same all over the territory of Samtskhe-Javakheti. Its yearly total amount is maximal in the ridge line of the Adjara-Imereti, Trialeti and Arsiani mountains. Here it exceeds 1200 mm and on the slopes – 1000 mm. The average yearly value of precipitations on the mountains of Javakheti, Samsari and Erusheti is 600-800 mm and more. It is clear that these high zones are not covered with vine. As to the bottom and adjacent areas of the Akhaltsikhe depression the yearly average value of precipitations is low, just 550-680 mm [Applied scientific climate directory of Georgia, 2004]. Such yearly total amount of precipitations is insufficient for vine growth. However, if we pay attention to its seasonal distribution we will discover quite different situation: namely, great quantity of precipitations in spring and summer, i.e. in the period of plant vegetation, when plants need humidity for active bio-functionality, is quite sufficient for vine growth and development. During 5 months (from IV including VII) the precipitation amount is more than 54% of the yearly value. Due to these circumstances vine development is quite possible even without irrigation in many areas of the region, though irrigated medium would be much better and would give better harvest [Rtskhiladze, 1956, p.42].

According to the yearly total amounts and seasonal distribution of the atmospheric precipitations there is similar situation on the Javakhti plateau. For example, according to the data of the Akhalkalaki meteorological station the yearly average value of precipitations here is 600 mm, 57% of which is observed during the same 5 months. Therefore, taking into consideration the average yearly value of the precipitations this region is also favourable for vine growth. The exception is only the western part of the Akhalkalaki plateau – the right bank of the river Mtkvari, where the precipitation amount is 400 mm and less. However, the main factor here is that there are more precipitations during warm periods compared to cold ones, though on the other hand such seasonal distribution of precipitations is negative for vine growth and development, since the amount of precipitations during cold periods is insufficient for the accumulation of moist in the soil. For the prevention of this problem it is necessary to irrigate vineyards for winter, a measure that used to be taken in the past [Ketskhoveli, Ramishvili, Tabidze, 1960]. Low temperature compensates the moist deficit in winter period, since the value of evaporation from the soil surface is low. However, the precipitations that come during night, i.e. a low value of the effective precipitations have a negative influence on vine growth on the Javalketi upland. Namely, the average value of precipitations that come during nights makes 45% of the whole total amount in the hypsometrically low part of Samtskhe, whereas on the Javakheti upland it is just less – 41%. Shortage of effective precipitations has negative influence on vine growth and development.

Notwithstanding the lack of atmospheric precipitations the relative humidity is comparatively high in the hypsometrically low part of Samtskhe. This is caused by the low temperature in winter. The only exception is the central part of the Akhalkalaki plateau [Javakhishvili, 1981].

4.5. Diversity of vine cultivars

In Samtskhe-Javakheti, especially in Meskheti numerous vine cultivars must have been spread in the past. However, the names of the most of them have not survived. Different sources [Javakhishvili, 1981; Chikovani, 1987; Beriashvili, 2011; Ketskhoveli, 1957; Ketskhoveli, Ramishvili, Tabidze, 1960; Chikovani, 1987; Cholokashvili, Chakhnashvili, 1929; Javakhishvili, 1986; Beridze, 1965; Compilation of data,,,,. 1894] give different numbers of the vine cultivars. Taking into consideration numerous sources we have registered 59 vine cultivars in this region (Fig. 1). Compared to other regions of Georgia this one is just poor in the quantity of cultivars but very significant for its aboriginal vine varieties.

Nowadays it is very difficult to determine which of the species was the most spread in the past in Meskheti. In 1950-ies in this point of view five cultivars were dominating (Aligotte, Chinese, Green Goruli, Rkatsiteli, Pinot Black), which covered 86% of the common area of the vineyards [Ketskhoveli, Ramishvili, Tabidze, 1960]. The first two of them covered the largest areas – 38% and more than 20% accordingly of the common area of the vineyards. By the areas and density of vineyards Samtskhe-Javakheti is almost the last among other regions of Georgia (*Table 1*).

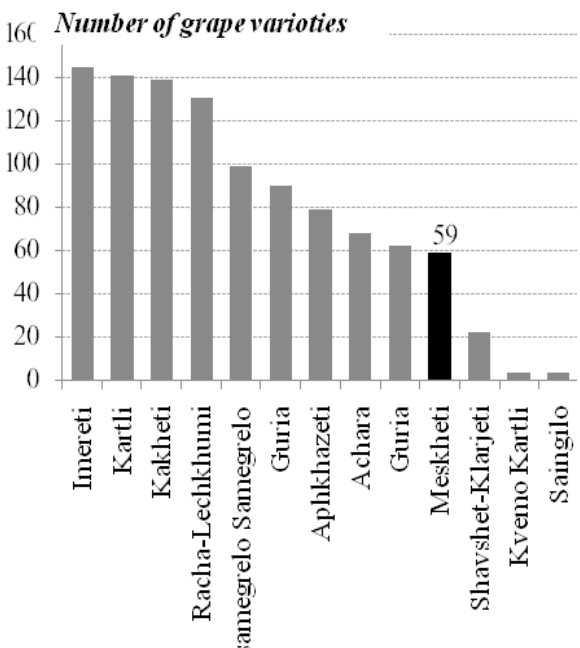

Fig. 1. Grape Varieties According to Regions of Georgia

4.6. Diversity of vine cultivars

The traditions of viticulture in Meskheti are proved by discovery of wine-jars, wine press, wine cellars, grape must, former vineyards, vine remains, etc. This is also proved by the wine press galleries in cliffs found in the monastery complex of Nardzia. The information about vine cultivar remains turning wild in some villages survived in various sources is also a true confirmation of vine growing in the past in Samtskhe-Javakheti.

4.7. Toponyms linked with vine and wine

There are many toponyms linked with vine and wine in Georgia. This abundance is caused by the wide spectrum of wild and cultivated aboriginal vine varieties characteristic of our country. This is the reason for development of original and high quality viticulture and wine-production at the background of diversity of natural conditions. The abundance of geographical names linked with vine and wine is also caused by the fact that Georgia always have been a country of vine and wine and historically

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viticulture and wine production have been the most dominant fields of its agriculture [Nikolaishvili, 2010].

Table 1. Vine cultivars in the historical-geographical regions of Georgia

Regions of Georgia	Area, thousand km^2	Total	Density, a unit/ km^2
Kakheti	12.2	133	10.9
Kartli	12.2	132	10.8
Imereti	6.6	121	18.3
Racha-Lechkhumi	3.3	119	36.0
Guria	2.0	91	45.5
Samegrelo	4.4	88	20.0
Abkhazia	8.6	79	9.2
Adjara	2.9	63	21.7
Meskheti	2.6	35	13.5
Lower Svaneti	1.3	3	2.3

Since viticulture was one of the significant branches of agriculture in Meskheti, it is natural that it is expressed in everyday speech and geographical names. For example, we may recall many names used in terrace viticulture as: "*barna venakhi*"(high grown vineyard), "*pekhis vazi*" (*leg hight vine*, i.e. low vine), "*mzis guli*" and etc.To determine the exact number of geographical names linked with vine and wine is impossible, since they are expressed as words linked with vine varieties, grape types, and other ampelographic signs and wine production in microtoponyms. On the basis of the analysis of various sources we have registered approximately 400 toponyms linked with wine [Nikolaishvili, etc., 2014]. Such names are met nearly in every region of Georgia with viticulture and wine production traditions. Meskheti is not a prominent region regarding viticulture and it lags behind other regions as Samegrelo, Imereti, Kakheti and etc. However, it is important to study this region regarding viticulture as far as it enables us determining the viticulture areas in the past.

5. Conclusions

According to the analysis of different sources viticulture is quite limited on the territory of Samtskhe-Javakheti and it is spread only in Samtskhe – at the bottom of the slopes. However, we cannot say the same in the historical context. Vine was grown not only here but in other places as well. Viticulture was spread in certain parts of Javakheti (mainly in its north-western and western parts), where viticulture must have been developed as well.

Although nowadays it is very difficult to restore the retrospective image of this region of Georgia in the past, the information from some historical documents and literary sources about viticulture or some certain cultivars of vine, also artificial terraces, toponyms, data, archaeological material, survived remains of wild vine and other material still enable conducting some researches. Besides, it is very important to estimate the environment, its favourability for vine growth and development. Such analyses are just general in this work. It is necessary to estimate favourability of the natural conditions of separate territories of Samtskhe-Javakheti taking into account the ecological peculiarities of each vine cultivar.

It is determined that the forms of the traditional nature management in Samtskhe-Javakheti, mainly adjustment to the environment, the technique of terrace construction indicate to the sustainability of the traditional natural management. Exactly, the terrace viticulture and fruit growing were the basis of agriculture during centuries in the region. Moreover, numerous survived old terraces, some part of which has been restored nowadays, together with other historical-cultural monuments, may be involved in the list of tourism objects.

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