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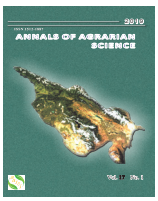

Major Agricultural Crops in the XVI Century Samtskhe-Javakheti

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A B S T R A C T

The paper represents a study of the XVI century historical document, known as the 'The Great Defter of Gurcistan Vilayet' and shows the agricultural image of the time. The document contains data describing Samtskhe-Javakheti region, which is located in the southern part of Georgia and unites six administrative municipalities. Above, mentioned historical source contains the information about the population, settlements, agricultural crops and taxes imposed on them. The paper focuses on the rye, millet, broad bean, cicer and lentil crops, which were widespread in described area, in the second half of the XVI century, but disappeared later. Research included land-use mapping, also creation of databases. The work also shows the results of the analysis of agricultural censuses from XX and XXI centuries, which revealed the major factors of disappearance of the crops.

Keywords: Retrospective cartography, Crops, Landscape change, Agricultural crops, Samtskhe- Javakheti, Georgia.

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Introduction

A crop diversity is a foundation for agricultural development of a country. To study and understand the traditional agricultural crops is strategically important to the states similar to Georgia. The existence of such crops in the area is an indicator of ancient traditions, maintenance and development of which can contribute to the food security and strengthening of agricultural sector. This can lead to the economic stability and empowerment of communities.

The officials of the Ottoman Empire prepared 'The Great Defter of Gurcistan Vilayet'in order to spread the influence over the territory of Georgia, and resulting from the developed political processes several historical regions of Georgia got under its command [1, 2]. The tax system of the Ottoman Empire itself implied the census and assessment of subjugated territories aimed to the tax collection. The imposed taxes entailed human custom duties (the military service of the Ottoman Empire) and a chief rent [1, 3, 4]. made in natural form, similar to the monetary one. The main concern of the Empire was to get the taxes. The way the goal would be reached did not matter. The region of Samtskhe-Javakheti was well developed from an agricultural standpoint. The tax data presented in 'The Great Defter of Gurcistan Vilayet' is the source that confirms the distribution of agricultural crops. The cereal crops are still in majority [5, 6]; The substantial part has disappeared from agricultural crops. In particular, this fact refers to millet and rye crops, as well as the legumes. Among the bean family, broad beans, lentil and cicer crops were traditional here and played quite an important role in the regional agriculture over the past centuries, however today a kidney bean replaced the other legumes.

By means of the historical materials, we have tried to study and assess the crops spread in the region and their state several centuries ago. Based

on the available basic sources (The Great Defter of Gurcistan Vilayet, results of 1923, 2002, 2014 agricultural inventories), we have assessed the distribution of the mentioned crops in the region and changes in the course of several centuries.

Objectives and methods

The 'Gurcistan vilayet' included the territory of modern Samtskhe-Javakheti, Kvabliani gorge adjacent to it and was extended to the territory of present-day Turkey, where it included the surroundings of Chrdili (Childir) lake, the Potskhovi River valley, as well as the upper part of Mtkvari River flowing through the Artaani plateau and the upper part of Oltisi River. Our research covers the part of the 'vilayet', which is in the limits of the modern Georgia that corresponds to the military-administrative unit of the present-day Samtskhe-Javakheti. The region under the study (Fig. 1.) includes six administrative units – Borjomi, Akhaltsikhe, Adigeni, Aspindza, Akhalkalaki and Ninotsminda municipalities [7]. The area of the region is 6412.8km2 [6]. Its population is 160, 5 thousand people [8]. The Didi Abuli Mountain (3301m) at the Samsari ridge is its highest point. The region is mountainous, with alternation of hollows, volcanic canyons, tablelands and mountain ranges. Here are represented Akhaltsikhe (Samtskhe) structural basin, the Lesser Caucasus mountain system, in a form of Arsiani, Adjara-Imereti and Trialeti ridges and volcanic highlands in form of Javakheti, Borjomi-Thori-Tsikhisjvari plateaus and Erusheti highland, as well as in form of Samsari and Javakheti ridges situated between volcanic plateaus, which borders with the region under study from the east. The regional climate transforms from moderate chilly subtropical one into a cold and the dry subtropical climate of mountain hollows, dry climate of mountain tablelands and cold climate of high mountains [9]. The amount of precipitation at the Javakheti tableland is within 500-600 mm, which is roughly similar within the limits of the hollow, while on the slopes of Trialeti, Arsiani and Adjara-Imereti ridges it increases and reaches the maximum of 1400-1500 mm in its upper part, approximately at 2200-2500 m height.

We have used the following materials to execute this work: 'The Great Defter of Gurcistan Vilayet', historical sources of the XVI-XX centuries, 1897 and 1923 census documents, as well as the results of a newest census in the form of the 2014 Geostat materials. As for cartographic documents, we made use of the map compiled by Jikia and Aslanikashvili in 1953, and large-scale 1:50000, 1:25000 maps and satellite images. In order to execute the work, we have used the method of retrospective mapping, the historiographic analysis and the statistical analysis, that assisted us in the manifestation of the situation revealed resulting from the processing of available archive documents and other sources.

The time interval of statistical materials is quite large. The numbers given in 'The Great Defter of Gurcistan Vilayet' providing us with information about what tax was imposed on different settlements; the equivalent of the chief rent was also calculated in kind, measured in weight and volume (so-called Qila), which slightly differed from each other in weight in case of various crops [1].

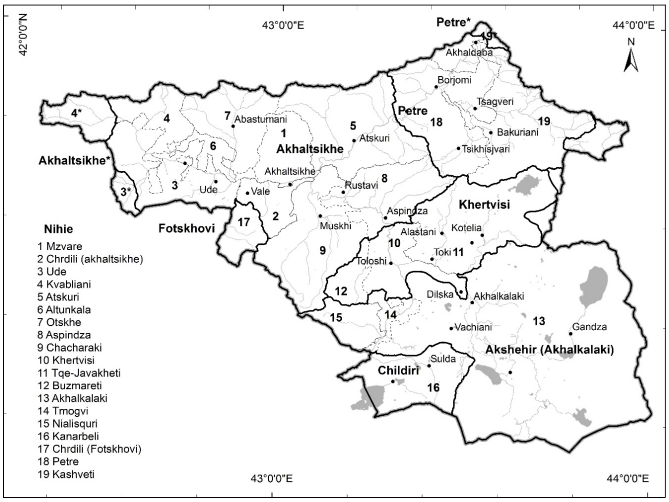

Fig. 1. *Map of the study area.*

The following materials were used as a basis of the map: large-scale 1:50000, 1:25000 maps and satellite images., By means of GIS-technology, we have selected the satellite images a zone of arable lands, which are suitable for agricultural crops, taking into account soils, slope inclinations, aspect and altitude above the sea level. We have composed GIS-layers of arable lands and perennial plantings, i.e. a zone, where the mentioned crops were cultivated.

The expedition method envisaged the visual study of land fund, directly in the field (on-site) and current state assessment. Field works foresaw an intensification of agricultural crop distribution area, and their verification with the outlines drawn from satellite images. We conducted GEO-information map compilation and analysis afterwards, when the tables calculated using Excel and reflecting the quantity of agricultural crops under study, sorted according the rural settlements, were transferred to GIS databases. The extrapolation was made for each settlement, according to arable lands. Thus, we got the map of the distribution of the above-mentioned crops for the second part of the XVI century, based on which we can conduct a comparative analysis and figure out what changes have happened during this time period and what trends exist as of today.

Results

Rye crop is still rare and occasionally found in Georgia. In the second part of the XVI century, the rye plantings were widely spread in the whole region under study. The five main areas of their concentration were identified, resulting from the mapping (Fig. 2.): 1. Samtskhe structural basin; 2. Uraveli gorge and Greli-Uraveli-Sakhudabeli band; 3. Javakheti highland; 4. Mtkvari valley from Aspindza to the south, in the Tolerta-Erkota-Atskvita band; 5. Niali fields, Buzmareti basin and its adjacent settlements, and according to administrative units of that time two peaks of their concentration are clear: Chacharaki district (Nihie) in Akhaltsikhe Liva (Sanjak) and Akhalkalaki district in the Liva (Sanjak) having the same name.

In total, the rye harvest was equal to 2356.96 tons, rye was sowed in 400 locations, other settlements were deprived of its plantings, including all those settlements, information on which is scarce. The zone of mentioned crops occupied far more areas than those where its actual plantings are distributed (Fig. 2.). Rye plantings occupy more than half of inhabited localities. However, today the plantings are available in singular experimental farms only.

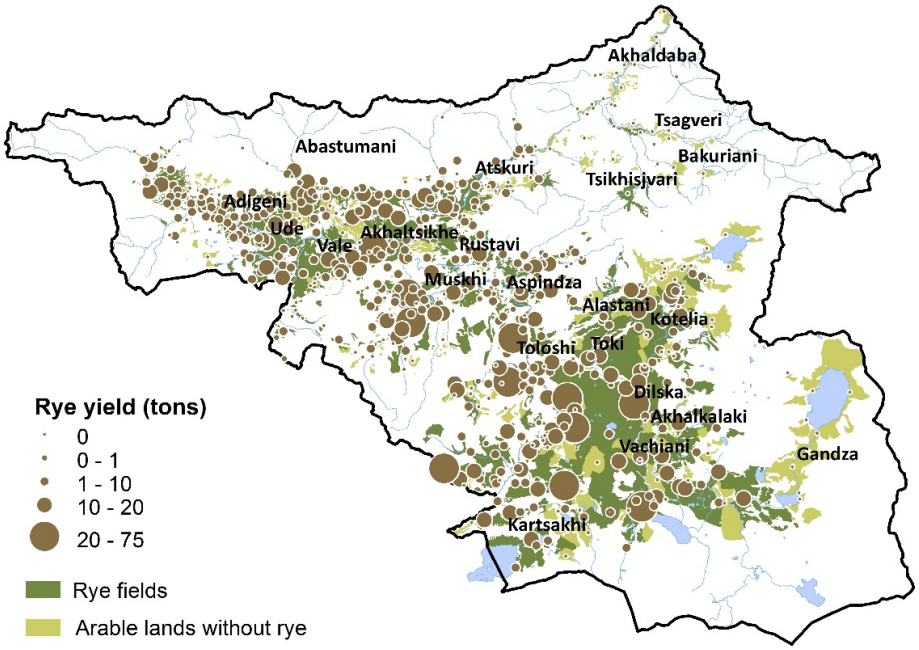

Fig. 2. *Rye plantings in Samtskhe-Javakheti in the second half of the XVI century.*

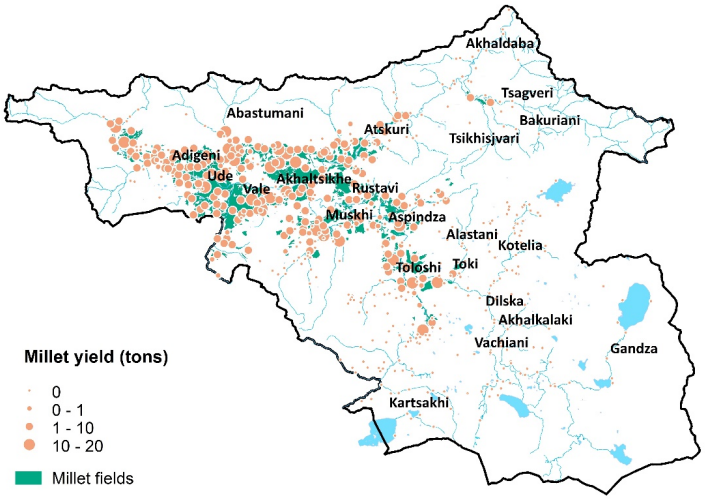

Fig. 3. *Millet plantings in the second halfof the XVI century.*

Millet plantings in the XVI century occupied far less areas, than in case of rye, since the millet was not the main food crop, as a wheat and barley. Its plantings ended at the approximately, 1500-1600 meters height above the sea level, which on one hand can be referred to its less productivity in highest belts, or else there could be another reason, e.g. that other crops were prioritized at the Javakheti plateau and Niala-Buzmareti volcanic fields, since it is not considered to be the best zone for millet plantings (Fig. 3.). The distinct concentration of their plantings in the millet distribution area is observed in the Samtskhe hollow; a relatively small area of its concentration is represented by Uraveli gorge. They are also concentrated on the Uraveli-Anda-Tskordza section and in the Aspindza-Saro-Nijgori-Toloshi band, from Tmogvi village to Nakalakevi. In total, 857.89 tons were harvested. The millet was sowed with 236 locations, other settlements were deprived of its plantings, including all settlements, information on which is scarce, since these villages were depopulated and their prescribed taxes, similar to rye plantings, are reflected in total monetary (Akce). The millet crop occupied a substantial sector in a third part of settlements identified in the area.

The millet plantings are concentrated in Udi, Mzvare and Chacharaki districts, while in the number of regions (Akhalkalaki, Tke-Javakheti, Kanarbeli, Nialiskuri, Kashveti, Kvabliani) its plantings are almost unavailable; The Kvabliani district is almost depopulated. The Kanarbeli, Nialiskuri, Akhalkalai and Tke-Javakheti districts avoided their sowing due to chilly climate, since in the Buzmareti district available settlements are almost in the same climate and edaphic conditions, as those of Nialiskuri and Kanarbeli. Millet plantings in small quantities were available there.

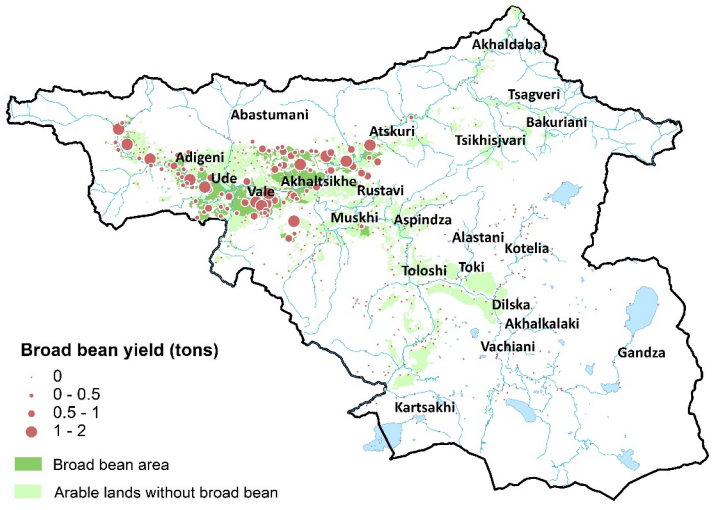

Fig. 4. *Broad bean plantings in the second part of the XVI century.*

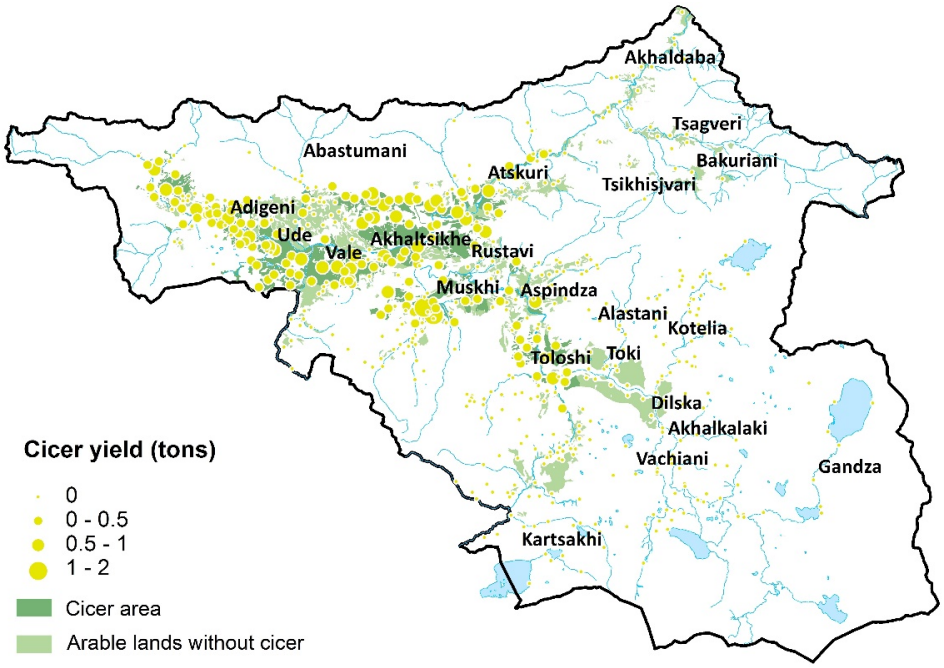

Fig. 5. *Cicer plantings in the second part of the XVI century.*

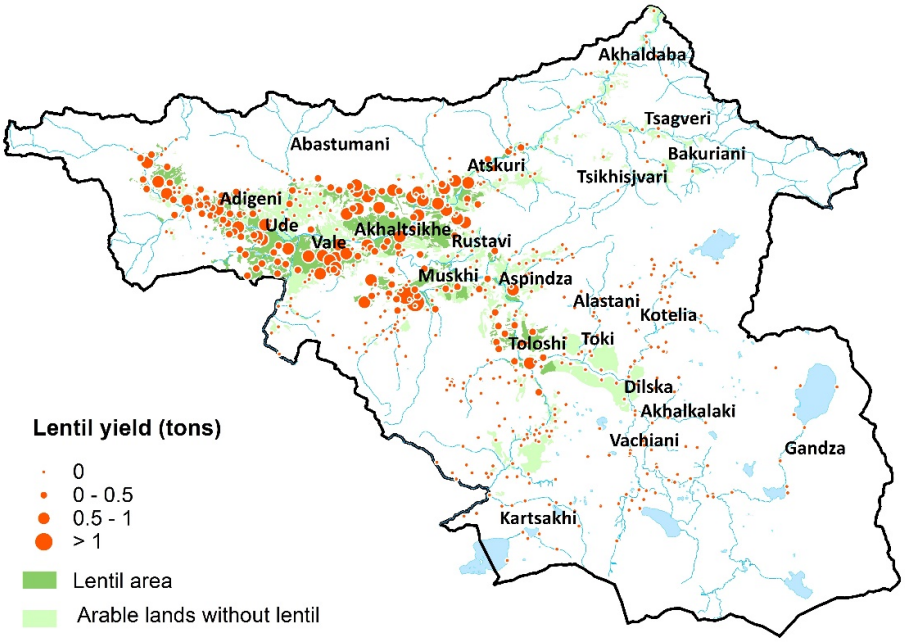

Fig. 6. *Lentil plantings in the second part of the XVI century.*

Broad bean (Fig. 4.) and cicer (Fig. 5.) plantings almost repeat the same zone, and their basic area coincides with each other as well as lentil (Fig. 6.) plantings repeat the distribution limits of other legume crops. The major part of them are, again, concentrated on the Samtskhe structural basin and in case of all three crops their harvest is getting smaller from the west of the hollow to its east. A top yield was obtained in Use district; the slightly less harvest is peculiar to Mzvare, Atskuri and Chacharaki districts; but the latter substantially lags behind other districts by broad bean plantings.

Table 1. *Administrative units entering into 'Gurcistan vilayet' at the present-day territory of Samtskhe-Javakheti and agricultural crops vanished today, as of the second part of the XVI century.*

Administrative units	Agricultural crops	Number of settlements with crops	Yield, Tons
Akhaltsikhe Liva			
Mzvare Nihie	Rye	18	97.9
	Millet	18	100.76
	Broad-bean	18	7.650
	Lentil	18	6.757,5
	Cicer	18	7.778
Chrdili (In Akhaltsikhe Liva)	Rye	22	113.52
	Millet	21	89.76
	Broad-bean	21	11.985
	Lentil	21	9.053
	Cicer	21	6.630
Ude	Rye	51	215.93
	Millet	51	171.27
	Broad-bean	39	16.575
	Lentil	50	15.81
	Cicer	50	13.388
Kvabliani	Rye	6	11.55
	Millet	1	2.2
	Broad-bean	0	0
	Lentil	1	0.765
	Cicer	1	0.255
Otskhe	Rye	18	113.3
	Millet	18	83.93
	Broad-bean	1	0.383
	Lentil	2	0.638
	Cicer	2	0.638
Atsk'uri	Rye	38	156.42
	Millet	26	77
	Broad-bean	14	8.16
	Lentil	21	9.18
	Cicer	21	7.65
Altunkala (Okrotsikhe)	Rye	14	87.45
	Millet	13	64.02
	Broad-bean	2	0.893
	Lentil	4	1.53
	Cicer	4	1.403
	Rye	35	147.18

Aspindza	Millet	25	45.98
	Broad-bean	1	0.255
	Lentil	7	2168
	Cicer	7	1785
Ch'ach'araki	Rye	40	326.15
	Millet	24	106.15
	Broad-bean	0	0
	Lentil	16	6.12
	Cicer	16	5.865
Total, in Akhaltsikhe Liva	Rye	242	1269.4
	Millet	197	741.07
	Broad-bean	96	45.9
	Lentil	140	52.02
	Cicer	140	45.392
Khertvisi Liva			
Khertvisi	Rye	29	242.11
	Millet	22	68.97
	Broad-bean	0	0
	Lentil	13	4.208
	Cicer	13	4.208
Tqe-Javakheti	Rye	35	226.6
	Millet	0	0
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Buzmareti	Rye	8	51.15
	Millet	0	0
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Total, in Khertvisi Liva	Rye	72	519.86
	Millet	22	68.97
	Broad-bean	0	0
	Lentil	13	4.208
	Cicer	13	4.208
Akshehir (Akhalkalaki) Liva			
Akshehir (Akhalkalaki)	Rye	43	355.3
	Millet	0	0
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Tmogvi	Rye	10	72.05
	Millet	2	12.1
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Nialisquri	Rye	15(5 Outside of Georgia)	96.8 (42.45 Outside of Georgia)
	Millet	0	0
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0

Total, in Akhalkalaki Liva	Rye	68	469.8
	Millet	2	12.1
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Childiri Liva			
Kanarbeli	Rye	15 (7 Outside of Georgia)	94.05 (37.95 Outside of Georgia)
	Millet	0	0
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Total, in Childiri Liva	Rye	15 (7 Outside of Georgia)	94.05 (37.95 Outside of Georgia)
	Millet	0	0
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Fotskhovi Liva			
Chrdili (In Fotskhovi Liva)	Rye	3 (9 Outside of Georgia)	3.85 (10.45 Outside of Georgia)
	Millet	12 (7 Outside of Georgia)	30.25 (27.5 Outside of Georgia)
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Total, in Fotskhovi Liva	Rye	3 (9 Outside of Georgia)	3.85 (10.45 Outside of Georgia)
	Millet	12 (7 Outside of Georgia)	30.25 (27.5 Outside of Georgia)
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Petre liva			
Petre	Rye	0	0
	Millet	2	5.5
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Kashveti	Rye	0	0
	Millet	1	2.75
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Total, in Petre Liva	Rye	0	0
	Millet	3	8.25
	Broad-bean	0	0
	Lentil	0	0
	Cicer	0	0
Total, in Region	Rye	400	2356.96
	Millet	236	857.89
	Broad-bean	96	45.901
	Lentil	153	56.23
	Cicer	153	49.6

The role and importance of the mentioned crops was high in the past, which was a good precondition for agriculture diversification and for a new introduction of a variety of crops (Table 1). In case, we compare the state of agricultural crops described in the 'Defter' with the current state, the change is obvious. It was interesting to figure out, what was the crucial moment, when the society stopped cultivating them. Was this fact related to any natural (climate, edaphic) or human factors?

According to the census conducted in 1923 (Table 2, 3), rye crop was still intensely cultivated in both Samtskhe structural basin and Javakheti plateau. The area under crops is small in Borjomi gorge. However, the reasons are different, from the present-day territory of Borjomi municipality is heavily devastated in the Defter, which cannot be said about the data of the 1923 census. The lack of arable lands, on one hand, and the functional change of this territory by the early XX century related to its use for recreation and health-

Table 2. *Agricultural plantings registered according to 1923 census [10]*

Mazra (administrative	N N	Community	Agriculture				
			Rye (ha)	Millet (ha)	Broad bean (ha)	Lentil (ha)	Cicer (ha)
Akhalkalaki	1	Alastani	108.56	0	1.853	0	0
	2	Baraleti	614.65	0	13.298	0.327	8.066
	3	Gorelovo	0	0	0	0	0
	4	Dilska	104.64	0	0	0	0
	5	Eshtia	5.886	0	0	0	0
	6	Kondura	85.238	0	0	0	0
	7	Kulikami	59.623	0	0	0	0
	8	Okami	251.57	0	0	0	0
	9	Sathkhe	26.596	0	0	0	0
	10	Khertvisi	105.95	0	0	0	0
		All	1362.7	0	15.151	0.327	8.066
Akhaltsikhe	1	Adigeni	32.373	2.507	0	0	0
	2	Ats'kuri	15.696	0.327	0	0	0
	3	Vale	86.219	0.327	0	0.109	0
	4	Varkhani	9.701	2.071	0	0	0
	5	Idumala	10.355	0.654	0	0	0
	6	Klde	1.635	0	0	0	0
	7	Lepisi	59.296	0	0	0	0
	8	Ude	14.933	1.308	0	0	0
	9	Uraveli	65.182	0	0	0	0
		All	295.39	7.194	0	0.109	0
Gori (Communities according of 'Gurjistan Villaiet' territory)	4	Akhaldaba	0	0	0	0	0
	7	Bakuriani	0	0	0	0	0
	8	Boriomi	0	1.962	0	0	0
	11	Guiareti	0	0	0	0	0
	12	Dviri	0	0	0	0	0
	32	Kvishkheti	0	0.327	0	0	0
	36	Tsagveri	1.09	0	0	0	0
		All	1.09	2.289	0	0	0
Total			1659.1	9.48	15.15	0.44	8.07

promoting purposes, on the other, are probable reasons for this fact. This region became the resort center of Romanovs' imperial family, and, respectively, the crops that took hold in the Russian Empire with high intensity (corn, potato) that was more rapidly distributed there. Distribution of potato has begun after 1840 and is chronologically related to the migration of different people groups of the Russian Empire (Dukhobors, Ukrainian, Polish and German migrants). The widespread replacement of local, traditional crops with the higher yielding and easy cultivated crops became a precondition for the encouragement towards the development of one-crop (monoculture) system in the Soviet Union and a major part of Javakheti was covered with potato plantings. Similar to the rye, the millet crop was of frequent occurrence in the Akhaltsikhe structural basin. The difference is that it had already been vanished from the Khertvisi community for this period. Roughly, the same took place regarding the lands of Borjomi Municipality.

Table 3. *The productivity of agricultural crops (in tons) registered according to the 1923 census [10]*

Mazra (administrative	N N	Community	Agriculture				
			Rye (ha)	Millet (ha)	Broad bean (ha)	Lentil (ha)	Cicer (ha)
Akhalkalaki	1	Alastani	271.41	0	3.706	0	0
	2	Baraleti	1536.62	0	26.596	0.654	16.132
	3	Gorelovo	0	0	0	0	0
	4	Dilska	261.6	0	0	0	0
	5	Eshtia	14.715	0	0	0	0
	6	Kondura	213.095	0	0	0	0
	7	Kulikami	149.057	0	0	0	0
	8	Okami	628.93	0	0	0	0
	9	Sathkhe	66.49	0	0	0	0
	10	Khertvisi	264.87	0	0	0	0
		All	3406.79	0	30.302	0.654	16.132
Akhaltsikhe	1	Adigeni	80.9325	6.2675	0	0	0
	2	Ats'kuri	39.24	0.8175	0	0	0
	3	Vale	215.547	0.8175	0	0.218	0
	4	Varkhani	24.2525	5.1775	0	0	0
	5	Idumala	25.8875	1.635	0	0	0
	6	Klde	4.0875	0	0	0	0
	7	Lepisi	148.24	0	0	0	0
	8	Ude	37.3325	3.27	0	0	0
	9	Uraveli	162.955	0	0	0	0
		All	738.475	17.985	0	0.218	0
Gori (Communities according of 'Gurjistan Villaiet' territory)	4	Akhaldaba	0	0	0	0	0
	7	Bakuriani	0	0	0	0	0
	8	Boriomi	0	4.905	0	0	0
	11	Gujareti	0	0	0	0	0
	12	Dviri	0	0	0	0	0
	32	Kvishkheti	0	0.8175	0	0	0
	36	Tsagveri	2.725	0	0	0	0
		All	2.725	5.7225	0	0	0
Total			4147.99	23.71	30.3	0.87	16.13

There was a very extensive and centralized agricultural policy of the USSR period. This policy was focused on the receipt of maximally abundant product and therefore the specialization envisaged growing such crops by 'Kollhozes' (collective farms) that could give higher yields. The development of this strategy caused the rooting of the crops that could bring higher yields for a specific territorial unit that is why those replaced traditional crops, which were distinguished by high crop yield and at the same time, which were more easily cultivated.

In the category of 'cereals and grain legume crops' of crop areas the legume crops were in the minority and mainly the kidney bean plantings are meant here, while the rest is occupied by the cereals. However, if we judge by the ensuing table (Table 4): rye and millet crops were no more sowed and, therefore, they had no part in the region everyday life, as agricultural crops [11].

Table 4. *Crop areas for cereals in the middle of the XX century (thousand hectares) [12]*

	Years		
Agricultural crops	1966	1968	1970
Autumn wheat	8.9	7.4	7
Autumn Barley	0.2	0.1	0.2
Spring Barley	19.6	16.3	15.8
Oats	1.1	1.4	2.2
Corn	3	2.4	1.9

These five agricultural crops had already been totally vanished from the explored region by that time. In addition, this process was developed just in several dozens of years. The crops that have thousand-year traditions disappeared in just dozens of years. The crops, which were successfully cultivated for thousand years, could not disappeared in several dozen years without an outside interference and this process is directly related to the agricultural policy pursued in the mentioned time period.

Conclusion

Based on the research outcomes, we can conclude the following: 1. Today, the presence of annual agricultural crops of the second part of the XVI century, except for cereals, cannot be felt in the region. Among traditionally existing cereal crops, only wheat and barley remain here; legume cultures are completely replaced by kidney beans; 2. The change of rules for the society and such distinct substitution of one agricultural crop by another could not have happened so simply, even due to recommendatory measures. The state-planned economy and collectivization of agriculture of the USSR period envisaged a centralization of farms and region's focus on a monoculture and planning of agricultural directions. These plans envisaged the receipt of maximally high yields emphasized the species that were aimed at quantitative indices and became a characteristic pattern of Soviet collective farms; 3. This trend caused an invasion of potato and corn crops in the 50-60s of the XX century and enlargement of their plantings at the expense of wheat, barley, rye, and millet plantings, as well. Today we reap the results of the mentioned state-planned economy that are expressed in the reduction of agricultural product diversity that makes up the traditional life and complicates the restoration-preservation of agricultural crops; 4. The comparative analysis conducted for the mentioned period gives us a good opportunity to be guided by the available information, should the local population, farmers and agribusiness sector of the mentioned branch of agriculture be interested in it. Since the traditional local agriculture, its crop species are part of regional traditions and culture, one of the forms of heritage, restoration and renewal of which is an important component of regional development.

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