

AN EXAMPLE OF ECOLOGICAL ADAPTATION. THE CULTIVATION OF VINES ON THE RIVER FLATS IN SZENTES

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Abstract: With the regulation of the rivers vast areas along the Tisza River were drained. As a result of this process flood plain farming gave way to the cultivation of field crops. However, the traditional forms of farming survived on the river flats between the dikes and the river and in the early 20th century vines and fruit trees were planted on the higher areas here outside many settlements along the Tisza River. The cultivation of vines in a manner adapted to the ecology and natural conditions of the river flats in Szentes resulted in the production of table grapes in quantities exceeding the subsistence level, for sale on the market. The article attempts primarily to explore the natural conditions determining this special form of cultivation. The most important natural factor is the periodical inundation during floods which fundamentally influences the course of grape production. The author examines how people farming in these areas are able to adapt to the harsh natural conditions, how they organise the cultivation and whether this ecological adaptation can be regarded as successful and viable.

Keywords: ecological adaptation, cultivation of vines on river flats, Szentes, Tisza

INTRODUCTION

With the regulation of the rivers vast areas along the Tisza River were drained. As a result of this process flood plain farming gave way to the cultivation of field crops.¹ However, the traditional forms of farming survived on the river flats between the dikes and the river and in the early 20th century vines and fruit trees were planted on the higher areas here outside many settlements along the Tisza River. The cultivation of vines in a manner adapted to the ecology and natural conditions of the river flats in Szentes resulted in the production of table grapes in quantities exceeding the subsistence level, for sale on the market. In this article I shall attempt primarily to explore the natural conditions determining this special form of cultivation. I attempt to apply in detail the first step in Julian Steward's ecological method, that is, an analysis of the interaction between the exploiting or producing technique and the environment.² As we shall see, the most important natural factor is the peri-

¹ The regulation of the Tisza River carried out in the second half of the 19th century was one of the biggest landscape transformations in Europe and fundamentally changed the ecological conditions of the Great Plain. The main result of the regulation was a very substantial increase in the area of arable land along the river.

² STEWARD 1955: 22–30.

odical inundation during floods which fundamentally influences the course of grape production. I shall examine how people farming in these areas are able to adapt to the harsh natural conditions, how they organise the cultivation and whether this ecological adaptation can be regarded as successful and viable.

The material collected consisted mainly of interviews with the vine-growers, observations made in the field and a study of the written documents on the subject found in the Szentes Archive. Research work in the archive revealed various types of useful sources. The study of maps from the 19th century and land records enabled me to show the change over time in the ownership of land and the branches of cultivation and also to make a statistical study of the data they contained. This complex approach to the research made it possible not only to present the period still accessible through reminiscences but also to trace the development over time in the characteristic forms of farming in the areas examined, from the early 1800s to the present.

THE ECOLOGICAL APPROACH TO CULTURE

In the 1960s and 1970s there was a steady increase in the number of investigations focusing on the relationship between culture and the natural environment and their interaction. In addition to studying the evolution of culture, these studies aim to explore the environmental determination of certain particular areas of culture, through the combined use of methods of social science and ecology. In Scandinavian ethnology greater emphasis has been placed on the ecological approach in studying forms of farming determined by cultural regions, innovations and the natural environment.³ In Hungary the research trend shaped at the 1986 congress on economic history in Bern and known as *historical ecology* has been established.⁴ However, the methods of ecological anthropology developed and applied by Anglo-Saxon researchers have not yet been widely adopted, although a good few attempts have been made in recent decades to disseminate information on the new research trends. Béla Gunda and Tamás Hofer attempted to use the concepts of ecology in examining the organisation of cultural groups. Gunda took the concept of *culture core* from Stewart and tried to use it in his research.⁵ Gyula Viga considers that the ecological approach should be given a wider interpretation in time and space.⁶ Balázs Borsos makes exemplary use of the findings of ecological anthropology in his work *Három folyó között* [Between three rivers] in which he examines the changes in farming and land use in the Bodrogek region from the angle of adaptation.⁷

³ LÖFGREN 1976: 100–115; STOCKLUND 1976: 84–99; PENNANEN 1985: 59–112; STORA 1985: 113–146; TOUMI-NIKULA 1985: 147–163.

⁴ BORSOS 2001: 7, 12

⁵ GUNDA 1980: 9–21; 1986: 3–13; HOFER 1980: 115.

⁶ VIGA 1996: 271–272.

⁷ BORSOS 2001.

NATURAL ENVIRONMENT

In Szentes vines were cultivated on the river flats on the *Kis-Tisza* [Little Tisza] and *Zsúp* islands. Many Szentes families still cultivate vineyards on the former, but vine-growing has completely ceased on the latter because the plots passed into the ownership of an agricultural co-operative in the late 1960s. *Little Tisza* is a natural formation, it was already an island before the regulation of the river. The branch of the river on the side of the town, known as the *Little Tisza* gradually silted up, and now the area only becomes an island again in times of flood when the water reaches a certain level. *Zsúp* island was created during the river regulation work when the so-called 85/1 cut was made; it is a triangular area with sides one kilometre long. *Zsúp* island is beside the right bank of the river, separated from the town by the main branch of the river. Both areas lie in the flood plain which means that they are inundated when the Tisza is in flood.

The river flats extend from the main bed of the river to the furthest higher ground. The river regulation created reserve areas on the river flats. The flood plain extends from the bank to the flood prevention dikes; its role is to contain flood waters and store the overflow.⁸ The river flats have their own climatic conditions differing from those of the neighbouring areas. The mass of water has a moderating effect on the extreme temperatures characteristic of the Great Plain. Humidity in the flood plain is 10–15% higher than outside the dikes. The alternation of day and night give rise to intensive micro precipitation.⁹ The flood plain soils are structureless, the annually recurring inundations prevent the formation of characteristic soil profiles under the influence of vegetation. However, the alluvium carried by the inundations contains the few percentages of humus required for the development of plants. The water supply of the alluvial soils found within the dikes is favourable since the periodical inundations saturate the soil. The soil moistness caused by the floods is beneficial to all plants as long as the pores are not filled permanently causing a lack of oxygen for plants. When the river flats are under water, warming or stagnant water can represent a big danger for the vegetation.¹⁰

The flood plain is far from being an area with a level surface. It has characteristic natural features shaped by the floods. The surface is higher in the strip beside the shore in the middle and lower reaches of rivers. These raised sections of banks are created by the deposit of alluvium near the banks during floods. Progressively less alluvium with finer grains is deposited in the areas further from the banks, due to the diminished energy of the water and the effect of wind.¹¹

Three characteristic flood types can be distinguished each year on the Tisza: the spring flood caused by melting snows in winter or the end of winter and subsequent spring rains, the spring flood beginning with the rains in May and June and some-

⁸ RÁTÓTI 1963: 205.

⁹ ANDÓ-IVANICS 1964: 190–191.

¹⁰ IVANICS 1963: 125, 131.

¹¹ KOLTAY 1961: 237.

times lasting into July and the autumn flood caused by autumn rains. One or other, or even all of these may be absent in a given year. The spring floods in March and April predominate in the Tisza river system.¹²

FARMING BEFORE THE REGULATION OF THE RIVERS

150–200 years ago the people of Szentés lived under different natural conditions from those prevailing today. On the areas inundated by the Tisza, where alternating ploughed fields and farms now lend variety to the landscape, there were vast meadows, reeds and marshes before the regulation of the rivers. When the river was in flood it flowed out into the river flats, but at the same time the alluvium it deposited fertilised the deeper lying areas outside Szentés. The people living here adapted to the natural environment and strove to create many-sided, complex farming that would ensure a reliable livelihood. Before the regulation, use of the river flats was a complex agricultural activity adapted to the natural conditions and all its elements fitted into the work to obtain or produce food.¹³ Up to 1836 use of the meadows and river flats in the land around Szentés was regulated by contracts signed between the estate and the town.¹⁴ The town could use the *Lower* and *Upper meadows*, while the Bökény meadow remained in the hands of the estate. The people of Szentés could gather reeds for roofing and firewood from these areas. The grass that grew on the meadows under the favourable conditions created by the annual floods was an important source of fodder for their livestock. The meadows were divided up in different ways. In general, distribution was according to wealth since the meadow qualified as an intangible part of the land held in villeinage, but the poorer strata also had the possibility of access to reeds, hay meadow or grazing land. In the late 1850s most of the inundated meadows disappeared. Thus, by the mid-19th century the practice applied in use of land areas was restricted to those areas which continued to be inundated when the Tisza was in flood. Use of the *Little Tisza* and *Zsúp* islands mainly meant use of the forests found on these areas which represented a great value in Szentés which had few trees. As already mentioned, up to 1836 these forests were in the hands of the estate. After that time the areas that passed into the possession of the town became an important source of income for the settlement. Before utilisation, the town councillor inspecting the areas reported on the quantity of timber that could be cut. The records of council meetings often listed even the number of willows suitable for pollarding, as well as the quantity and quality of the timber taken. Besides the timber, the grass that grew on the island was also of considerable value. The clearest proof of this is the often applied practice of not dividing up *Little Tisza* island in the same way as the other river flats but leaving the hay as winter fodder for

¹² VÁGÁS 1982: 34.

¹³ ANDRÁSFALVY 1975; BELLON 2003.

¹⁴ Under an agreement made in 1836 between Szentés and the Károlyi family, the town redeemed its services as landowner for a specified sum.

the bulls kept by the town or farms. The island was inspected by a delegation or by the *Pusztabíró* [land magistrate] who then made a report to the council on the quantity and quality of produce that could be anticipated, or whether the given area should be used as hay meadow or grazing land. The maps made in 1866 and 1884 also show that the *Little Tisza* and *Zsúp* islands were used as hay meadows. After the hay was collected, the areas were rented for autumn grazing and the proceeds were divided among the owners. Besides the hay mown on the island, rushes and reeds were also an important source of income. There was also fishing in these areas in the 18th and 19th centuries. There were 15 fishermen's huts on *Little Tisza* island and 20 on *Zsúp* island active in the 19th century. There were also substantial changes at that time in ownership. After the regulation of the Tisza the areas enclosed within the dikes were divided up among the prosperous Szentes farmers by the town in December 1865.¹⁵

FARMING AFTER THE REGULATION OF THE RIVERS

Substantial changes occurred in farming on the *Little Tisza* and *Zsúp* islands at the turn of the 19th century. In response to the damage caused by Phylloxera attacks (in the 1880s and 1890s) growers began to plant large vineyards on the river flats where the soil was sandy.¹⁶ According to the maps used in the 1908 cadastral survey of land holdings, by then there were vineyards on the greater part of the islands.¹⁷

An examination of the maps made in 1866 and 1884 shows that the landholders used both areas mainly as meadow. Land records from the late 1880s show that the holdings on *Zsúp* were ploughed and brought under cultivation. This change also occurred on *Little Tisza* island although it affected fewer holdings (14 *hold* 1051 *négyszögöl* [1 *hold* = 0.57 hectare, 1 *négyszögöl* = 3.57 m²]). The survey made in 1912 gives the names of Szentes residents having land on *Zsúp* island and also lists the branches of cultivation which clearly reflect the changes I studied in the utilisation of the river flats. According to the survey *Zsúp* island covered an area of 66 *hold* 958 *négyszögöl*. Field crops were grown on 32 *hold* 396 *négyszögöl*, vines on 15 *hold* 247 *négyszögöl*, 17 *hold* 1046 *négyszögöl* was forest, 588 *négyszögöl* meadow, 237 *négyszögöl* reeds and 1 *hold* 44 *négyszögöl* was not subject to land tax.¹⁸

¹⁵ MÓD 2001: 167–172.

¹⁶ The Phylloxera (grape louse) was brought to Western Europe from North America in 1858–62. It first appeared in Hungary in 1875. In the space of 4–5 years it destroyed most of the historical wine regions. At the same time work was begun on a large scale to plant vines on areas of the Great Plain with sandy soil resistant to the pest. In Szentes vines had been cultivated since the 18th century in the *Berek* and *Nagyhegy* areas. Most of these areas fell victim to the Phylloxera. It was for this reason that in 1902 vines were planted on 20 “hold” (1 hold = 0.57 hectare) on the immune sandy soil of *Zsúp* island.

¹⁷ Szentes Branch Archive of the Csongrád County Archive (CsML SzF), cadastral maps of the town of Szentes. 32.119.

¹⁸ CsML SzF V. 177. f. 29. Documents of the mayor of Szentes.

In the river flats an effort was made to plant vines mainly on higher land along the banks with lighter sandy soil. The reason for this was that the floods recede first of all from these areas and the water does not warm up around the vines which could easily lead to their destruction. The lower-lying areas with heavier soil where the water lies for longer periods are used mainly for field crops even today. Maize, which has time to mature after the retreat of the summer floods, is grown on these areas. The lower areas below the vineyards are used as vegetable gardens. Since the soil cannot be tilled until around a week after a flood, only vegetables with a short growing season can be planted. The nutrient-rich upper layers ensure an abundant crop. The location of the river flat vineyards is determined largely by the height of the area above the river, that is, by how long it is under water.

A study of the varieties of vines planted in the vineyards on the river flats at Szentes shows a strong predominance of table grapes. It follows that wine production, both in the past and at present, has only been of secondary importance. The most widely grown variety of table grapes is *Chasselas* which was introduced to Hungary in the 18th century by the Calvinist minister József Fábián. Both the white and red forms of Chasselas are still grown in Szentes. To a lesser extent, *Petrezselyemszőlő* (= Parsley grape) (*Chasselas blanc ciotat*) is also found; this can be regarded as a form of Chasselas. The Hungarian name refers to the deeply serrated leaves.¹⁹ According to the growers with vines on the river flats, the success of Chasselas is due largely to the excellent soil endowments and the favourable microclimate. The same variety grown on Nagyhegy or even in Csongrád (a town 10 km from Szentes) does not produce anywhere near the same quantity or quality of grapes, the bunches are looser and the taste cannot be compared to that of grapes grown on the island.

In the past manure was not spread on vines grown in the vineyards on the river flats. It is still the general opinion that the annual floods bring fertile mud which provides the nutrient the vines need. Growers on the island consider the water to be largely beneficial because the fertile, nutrient-rich mud deposited by the river is good for the vines. Experience shows that the water only causes destruction if it covers the vines for a long period and the temperature rises.

The Tisza floods are still a vivid memory among the island vine-growers, as the big floods also had a considerable impact on the vineyards in the river flats. In 1940 a very high flood with melting ice and a prolonged spring flood caused problems. In 1941 the first flood began in January, followed by another in February, a double flood wave in April and a spring flood in May. The flooding in 1942 was less severe but there was still quite heavy flooding following the spring thaw, and a spring flood.²⁰ In 1962, under the influence of the winter thaw and even more the spring rains, the March flood was followed by the main flood in April, causing extensive destruction on the *Little Tisza* island too. In 1965 the spring floods on the Tisza were not heavy but in June a great flood wave came down the river. The farmers had a

¹⁹ KOZMA 1968: 360.

²⁰ VÁGÁS 1982: 96–101.

very poor harvest that year because of the summer flood. The 1968 spring flood also caused considerable destruction on *Little Tisza* island. The flood in the winter of 1968–69 was especially memorable. The flood of 1970 caused heavy damage mainly because the vines were under water for a very long time, for months. The growers could not go into the island until August but the buds had suffocated under the water and died. In 1974 heavy rains in June once again caused serious flooding on the river. The flood of 1980 caused great damage in the vineyards on *Little Tisza* island because the vines were flooded in late July and early August when the grapes were already ripening. In such cases the water can ruin the crop in only a few days. The floods of 1999 and 2000 caused very extensive damages not only to the vines but also to buildings. Many vineyard huts with a light wooden frame structure were smashed and on *Zsúp* island the upper level of the ferry house collapsed. The vines survived these natural catastrophes and came into leaf, although later than usual. However, due to the big floods in the years around the turn of the millennium there was no grape harvest for years. For this reason more and more growers decided to give up this activity and sell their land. In recent years many of the plots have changed hands as a result. The new owners are not cultivating the land but want to use the plots for holiday homes because of their proximity to the river.

The vineyards on the river flats not only suffer from the big, destructive floods but are also vulnerable to the frequent, smaller floods. This is especially the case for the low-lying areas which are often inundated. There have been years when the island was under water seven times. A 1200-metre-long dike parallel with the *Little Tisza* protects *Little Tisza* island, especially the low-lying areas, from smaller floods. Handling the flood-gate in the dike was one of the tasks of the guard who protected the vineyards. When the river was in flood the gate was closed so that the water could not flow into the island right away. However, it often happened that although the dike kept the floodwaters back, they welled up on the island behind the dike. These were drained after the flood receded by opening the flood-gate. If the flood was so heavy that even the dike could not protect the low-lying areas, the flood-gate again played an important role after the flood passed. When the gate was opened, the water trapped on the island drained away more quickly as the level of the river fell and the land could be cultivated sooner.

After the floods, poplar and willow seedlings come up like mushrooms and can only be eradicated with hard work. After the flood waters recede, the soil on *Little Tisza* island is often covered with a layer of mud and becomes compacted and hard when it dries. As soon as the soil can be cultivated the mud deposited by the water is loosened with a fork with curved tines to aerate the soil. The vineyards with heavy soil that is difficult to cultivate are dug frequently, making the soil more friable.

On *Little Tisza* island *cane pruning* is still a popular pruning method for low-trained vines. This means that 2–3 spurs and one cane with 6–8 or 8–10 buds are left on each vine. According to some of the growers, this method of pruning was widely used in the vineyards in the river flats because the buds on the canes were relatively high above the soil and so floods caused less damage since the vine was able to breathe through the top buds. After the flood of 1970 cordon training became in-

creasingly popular on *Little Tisza* island. Before that, vine-growers had trained cordons not for the sake of the crop but to create shade for those working in the vineyard. Vines were trained over frames outside the huts and at the end of vineyards and beside the paths. The growers trained the vines on high cordons in an effort to reduce the destructive effects of floods. However, *Chasselas* vines do not respond well to this form of training as they easily become lanky and produce too many shoots.

The periodical inundation also had a considerable influence on the architecture of the vineyards on the river flats. The buildings here represent a special type of the vine sheds and huts found in the vine-growing regions of the Great Plain. In contrast with the press-houses used to process the grapes and store the wine, the structures in the vineyards on the Great Plain provided shelter for people working in the vineyards and served to store tools and as temporary accommodation. Various types of buildings are found in the vineyards on the river flats but the landowners on the island refer to them all as *kunyhó* or *gunyhó* (hut). These one-room structures with brick walls were used in the past to store tools and as temporary accommodation. In contrast, the vineyards on the river flats are all located in areas that are periodically inundated, where the natural environment did not allow the use of mud-brick walls because such buildings would have collapsed after heavy floods. The growers on the river flats therefore used techniques to erect buildings that would resist floods and that could be repaired with relatively little work. In the same way as the choice of land suitable for the cultivation of vines, the most important consideration in selecting the site for a building was that it should be on relatively high land, less endangered by the floods. If there was no suitable site, the growers built an artificial mound and placed the hut on it. Besides walls with wooden frame structures, huts were also built with walls of woven withies or of bricks. The latter became very common in the 1960s and 1970s. The last hut with walls of woven withies fell into decay 10–15 years ago. In recent years there has also been a considerable decline in the number of huts with light wooden frame structures. Most buildings of this type were swept away or damaged by the floods. In the 1970s quite a few of those buying land on *Little Tisza* island built holiday houses on stilts which are better able to resist the Tisza floods.

SUMMARY

The vineyards planted on the river flats at the turn of the 19th–20th centuries represent a new stage in the history of viticulture on the Great Plain.²¹ The *Phylloxera* attack largely contributed to the emergence of a form of cultivation adapted to the natural endowments since it almost entirely wiped out the vines in many settlements along the river. As a result, the cultivation of vines shifted from the flood-free

²¹ ÉGETŐ 1993: 37.



Fig. 1. Light timber frame wall structure (Szentcs, 1999)



Fig. 2. Vineyard hut during a flood (Szentcs, 1999)



Fig. 3. Pruning vines in early summer (Szentcs, 1999)

areas with heavy soil to the river flats. In Szentcs the cultivation of vines adapted to the ecological conditions resulted in the production of table grapes in quantities exceeding the level of self-supply, providing a supplementary income for 60–70 families. Consequently, the production of wine was and still is only of secondary importance. The natural factor with the greatest influence on this distinctive form of cultivation is the periodical inundation occurring at the time of floods. The growers planting and cultivating vines on the river flats tried to adapt to this circumstance. Up to the 1990s the cultivation of vines on the river flats despite the unfavourable natural conditions can be regarded as a successful ecological adaptation. Due to the heavy floods around the turn of the millennium no grapes were harvested for years. For this reason more and more people have decided to abandon vine-growing and

sell their holdings. Another circumstance contributing to this has been the sharp decline in the market value of Chasselas grapes with the result that cultivation of this variety now brings very little profit for growers.

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