

**APPLICATION OF VITICULTURE ZONING IN ISTRIA (CROATIA)  
AS IMPORTANT ELEMENT FOR VALORIZATION OF ALL  
TERRITORY RESOURCES (PRODUCT, ENVIRONMENT, TOURISM  
AND OTHERS)**

**APPLICATION EN ISTRIE (CROATIE) DU ZONAGE VITIVINICOLE  
COMME UN IMPORTANT MOYEN POUR VALORISER TOUTES LES  
RESSOURCES DU TERRITOIRE: DU PRODUIT, AU PAYSAGE, AU  
TOURISME.**

A. MILOTIC<sup>1</sup>; D. PERSURIC<sup>1</sup>; G. CARGNELLO<sup>2</sup>; K.KNAUS<sup>1</sup>; R. VELENIK<sup>1</sup>; M.  
STAVAR<sup>1</sup>

<sup>1</sup> Institute for Agriculture and Tourism, C. Hugues 8 – 52440 Porec – Croatia (HR) ,E-mail:  
[aldo.milotic@iptpo.hr](mailto:aldo.milotic@iptpo.hr)

<sup>2</sup> SOC Tecniche Colturali – Istituto Sperimentale per la Viticoltura, Viale XXVIII Aprile, 26  
31015 Conegliano (Treviso) – Italie, E-mail: [cargnellogiovanni@libero.it](mailto:cargnellogiovanni@libero.it)

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**ABSTRACT**

For construction of one innovative tourist project, was taken the historic zone of central Istria, the city of Motovun, with a rich agriculture and other territory resources. The project was done according facts of Global productive system of territory, with special accent to application of Global productive system of viticulture territory, as previously described Cargnello (1999) in the works about “grande” zoning. One very important component in the valorization process of Motovun city is certainly vine variety named Teran. Variety Teran done the red, hard vine, very special for agro-climatic condition of Motovun area. In this research was done the “reconstruction” of this historic variety, with aim to change in viticulture and vine technology, taken all specificity of tourist market and producer skills. For needs of zoning investigation was taken all specific factors of Motovun area, like: characteristic of soil, the vineyards surfaces, training form, yield and other. The special accent was done to marketing of product, in the chain grape-cellar-win-bottle-consumer. Like a specific consumer in this zone, exist the seasonal tourist market.



## RESUME

Un projet touristique innovant est en cours dans la zone historique croate d'Istrie Centrale, autour de la magnifique ville de Motovun. L'approche méthodologique repose sur le concept de «Système Productif Global du Territoire» et s'appuie tout particulièrement sur celui de «Zonage Vitivinicole». Elle tient compte de toutes les facettes, définies dans celui de «Grand Zonage» (Cargnello G., 1999).

L'une des composantes fondamentales dans ce zonage vitivinicole est la prise en considération du Teran, variété intéressante autochtone historique, qui produit un vin rouge très typique et très lié au milieu. Dans ce programme de zonage vitivinicole, ce vin a été «restauré» à travers une sélection clonale appropriée et l'application en vignoble et en cave de techniques et technologies d'innovation, en tenant compte bien évidemment du produit, du consommateur et du producteur.

Dans ce zonage vitivinicole, on a pris en considération par ailleurs les lieux, les dispositions foncières, l'orientation des rangs, les structures portantes (hauteurs, matériels, etc.), les systèmes de conduite, les systèmes de taille, la gestion de la végétation, de la production et de la vendange, les structures de transformation et de mise en bouteilles, ainsi que des aspects de communication et de marketing, et encore les structures pour la restauration et pour l'hébergement des touristes.

## INTRODUCTION

The town of Motovun is situated in the part of Istria called "the grey Istria". The name refers to the grey flysch layers that give the soil its greyish colour. Characteristic urban and rural settlements, situated on tops of the hills and perfectly incorporated into the surroundings, provide a special visual effect often associated with the features of the whole Istrian landscape, and give the area its characteristic trait. Motovun is the best example of such a settlement. It got its present form in the Middle Ages, as a fortification at a place where a prehistoric necropolis once stood. Among the people, there lived a legend about a giant living in the nearby Motovun forest who, tired of excessive masters' demands and ridiculing the gentle folk, came to the town and shook the bell-tower. This was not without a consequence - the top broke off and is still missing. The population of Motovun and the surrounding villages made their living by working in agriculture, cattle raising, fruit growing and viticulture. The slopes and terraces covered with vineyards and fruit trees added to the town's charms and enabled the characteristic diversity of the landscape.

In the thousand years of man's interaction with nature a recognizable and modified landscape was created, in addition to some vine cultivars such as teran, i.e. the Motovun teran, which has, over the years, become a synonym for this region.

## I. MATERIALS AND METHODS

In the paper, it has been investigated the economic effects of viticulture zoning of Motovun region. We have used the socio-economic analyses in the determined time row, the data about the natural characteristics of vineyards and growing cultivars, the analyses and calculation of economic effects of optimal use of available resources.



## DISCUSSION

### Characteristics of the Teran cultivar and wine

*Teran* vine cultivar is an old local cultivar well-spread in Istrian vineyards. Before phylloxera appeared and up to the 1930s it was the main cultivar for the production of red wines (Stiglic, K.; 1954). As early as 1894, C. Hugues indicated some undesirable qualities of *teran* wine produced at some positions in Istria that needed to be improved.

Viticultural zoning of 1957 put *teran* as a recommended cultivar in the viticultural area of Motovun, i.e. the whole of the viticultural zone there. The end of the 1950s and the beginning of the 1960s saw the start of the intensive research into this cultivar with the aim of improving its productive qualities and the technology of production. Thus the basic quality indicators became stable within the limits of certain standard values. (Table 1.)

New *teran* has a nice ruby red colour, which, with circular movements in the glass, changes to violet shades. With aging it changes to darker varieties of red, although it keeps its attractive red shade. The bouquet can be described as having floral and fruit characteristics, the distinguished smells being the smells of raspberry and violets. It has a special taste as indicated by analytical data: a relatively high amount of total acids and extract. New *teran* is a full wine whose taste is dominated by high acids and tannin, but on the positions around Motovun the amount of acids is at the low values borderline (Table 1) and, with some aging, it becomes organoleptically very acceptable, though it still preserves some of its sturdiness. According to enogastronomic specialists, *teran* perfectly suits typical Istrian agricultural produce such as aired ham, cheese, truffles and other food made from wild animal's meat.

### Socio-economic aspects

The social and political situation after the 2<sup>nd</sup> World War led here, as well as in other parts of Europe, to depopulation of rural areas, abandoning agriculture and leaving for towns. Those were the consequences of industrialization, development of tourism in the coastal area and a tribute to urbanization and the new concept of welfare it offered. Motovun also lost its population, and the agricultural land was abandoned. The number of inhabitants decreased by half in some ten years, and there were no signs that the disaster of disappearance could be avoided. (Picture 1.)

The only real chances for stopping the negative processes lay in encouraging the economy by activating the available resources - agriculture in the first place, and tourism leaning on the developed coastal tourist trade in the second.

By making plans of revitalization as well as regional plans, new possibilities and incentives for the development of economic activities to affect employment and demographic and social regeneration lay ahead. Some of the solutions for starting economic activities could have been based on using the region's own resources, primarily viticulture and wine production, the activities that had their natural favourable conditions and whose traditions were still preserved. Thus as early as 1957<sup>1</sup>, plans for the revival of vineyards throughout Istria and planting 4,350 hectares by 1961 were made. They envisaged the modernization of farming with the aim of enabling the use of mechanization and of cultivars, among which *malvazija* dominated among white cultivars with 60%, and *teran* dominated among red cultivars with 30% in the coastal area and 40% in Istria's inland, which means in the area of Motovun as well.

<sup>1</sup> The five-year action programme for the development of agriculture in the region of Pula (1957-1961), Pula, 1957



With the accompanying measures of state support, such as favourable loans for starting plantations, the development of communications and communal infrastructure, favourable conditions for the beginning of a new developmental cycle were created.

Since economic activities are based on economic provisions and are governed by economic laws, it was necessary to make programmes that took into account the interests of the local community and the economic interests of the wine producers. The programme of the area's revitalization had to be based on encouraging economic activities - viticulture and wine producing and tourist valorization of the whole area with Motovun in the centre. Planting new vineyards on basis of new technological laws led to creating new material basis and to some significant and far-reaching actions in the area. They created new objects and shapes in the area's architecture, new marks of the landscape's features, a new image of Motovun.

The viticulture developed on two basic local cultivars: white Istrian malvazija and red teran. Soon teran, due to its high quality and peculiarity became a respectable wine on the national market. It was associated not only with the vineyards but also with the whole region. The name of Motovunski teran brought pictures of a medieval town on top of a hill, surrounded by vineyards, the pictures of harmony and beauty of an area and human presence in it.

The study of the social and economic development of Motovun indicates some negative trends and demographic and social pauperization of the area. The solutions today, so much like in the recent past, lie in the valorization of available resources: viticulture, wine growing and tourism.

Today, we can say that viticulture played a positive role in improving the economic situation in Motovun in the period of intensive development from the 1960s to the 1980s, after which period there came a recession and gradual lagging behind in comparison with other regions. The set of cultivars did not correspond to the market demand: the areas under teran did not get any larger, and the other cultivars got lost in the average supply. The fame of Motovun's viticulture was fading, and market advantages, created by the picture of quality vineyards, were slowly disappearing.

The creation of a new picture of Motovun is only possible if valorization is approached in a new way and if it includes the whole area, using all the positive qualities in the historical, cultural and material heritage. One of the most important potential factors of economic development is viticulture together with wine production. It should be activated on new grounds and a modern approach to viticulture, which has a relationship among natural conditions (terroir), cultivars and man in its centre has to be adopted.

Zoning of vineyard areas gives rise to some new opportunities to establish a name for Motovun's vineyards position. According to the basic natural features, Motovun's vineyards region belongs to the viticultural zone of the Central Mirna, which stretches on both sides of the hilly land by the middle Mirna river. The zone's main feature is the flysh underground on which a series of soils were created, the climate is modified Mediterranean. The microclimate and the soil are influenced by the southern exposition by the right bank and the northern one by the left bank of the river, as well as the varying inclination of the land.

The chemical analysis of the soil on the flysh underground on three typical locations indicates a neutral reaction in the field layer, which in deeper layers (30-60cm) changes to an alkaline one. The amount of humus varies from 1.7 to 2.2% in the field layer and decreases with the depth of the profile. What is typical of these soils is a weak presence of physiologically active phosphorus and middle to strong presence of physiologically active potassium. On basis of these data we can conclude that the antropogeneous soils in the whole zone have maintained



the typical pedochemical qualities of flysh soils, except for a slightly higher quantity of potassium. (Table 2.)

The position of Motovun vineyards is on the left bank of the Mirna river, on the northern exposition, at 70 to 250 m above sea level. The average annual precipitation is about 1050 mm, and the annual sum of sunny hours amounts from 2000 to 2400°C. It covers an area of some 500 hectares in all, with the central, most typical part situated on 230 hectares, on a slight slope appropriate for the use of mechanization. Since experience has shown that in these conditions the best results are achieved by the autochthonous cultivar of red grapes and wine - teran, which has also proved to be the most interesting marketwise, zoning could confirm these facts. On the peculiarity of the region, i.e. wine, we could build the whole strategy of marketing and vineyard position as well as the whole vineyard zone as part of a general concept of creating a recognizable picture of Motovun area. The image of a new-old product, teran wine, should thus be made on the recognizable position, historical and cultural heritage, with the development of various aspects of tourism.

A marketing plan for the vineyard zone should be based on the following principles:

- product: Motovun teran as the central product, malvazija and white muscat (Momjan), high quality and peculiarity of products, recognizable design, etc.,
- price appropriate to the product, especially to its real value, as well as the target consumer group,
- channels of sale: catering facilities, specialized shopping spots (producers' cellars, enoteques), retail trade network (groceries, souvenir shops, etc.) within the limits of the vineyard zone, in tourist resorts along the coast, nationwide and abroad,
- improvement of sale: visual communications as the most effective kind of advertising, tasting, directly with sale, and visiting the facilities at the vineyard area (cellars, enoteques, catering facilities).

By zoning a vineyard area and with the application of an appropriate marketing tool, significantly better economic effects can be achieved than is now the case. This can be explained by an assumption that the potential and real value of wine is higher than the price that is now achieved on the market. By letting the consumer learn about the place where the grapes and the wine are produced, the natural conditions, the methods of production, traditions and customs related to the wine, he is given an opportunity to evaluate its real value himself. Thus, with the aim of encouraging the development of economy in this rural area in mind, with the aim of protecting the existing resources, we could create tourist offer such as rural tourism, tourism for sport and recreation, educational, camping, cultural, hunting, wine, gastronomic, ecological tourism and other mixed types of tourism.

Starting from the present condition in the structure of production and the estimates concerning the vine and wine products from the area of Motovun subzone, i.e. the vineyard position, we can estimate the differences in the value of production after zoning has taken place. The assumption is that all the grapes produced are also processed in the vineyard zone, that they have a protected geographic origin, and that, at least, one cellar and one specialized catering trade facility in the area are in the function of tourist offer made by agencies from the coastal area with a developed tourist trade. Under these conditions, the total value of viticultural and wine production would increase about six times, and the total effect of the increased tourist trade would double.



The influence of vineyard zoning on the development of some area, shown on the example of Motovun, cannot be generalized. It depends on several factors: the size of vineyard areas in a zone, the present state of the development of viticultural and wine production, especially the market and the application of marketing approach and principles, the development of other economic branches etc. On basis of the mentioned elements and the level of development of viticultural and wine production and the market for wines in Croatia, we can claim without doubts that the zoning of vineyard positions would have a positive effect on the total development of a region concerned.

## CONCLUSION

Viticultural and wine production had an important role in slowing the process of depopulation of Motovun area in the 1960s to 1980s period. Planting new vineyards enabled employment, start of economic activities, and kept the population in the area. The period also saw the creation of a positive image on the vineyard area on the national wine market as the area where the autochthonous cultivar of teran is grown, which gives wine of high quality and recognizable organoleptic features. Zoning viticultural and wine producing areas enables a new impetus to viticultural and wine production and activation of other resources, especially tourism. Adequate marketing measures can create a recognizable image of Motovun as an attractive place for tourists where historical and cultural heritage and vine plantations at the foot of the town complement each other, creating an impressive picture of beauty made by man and nature.

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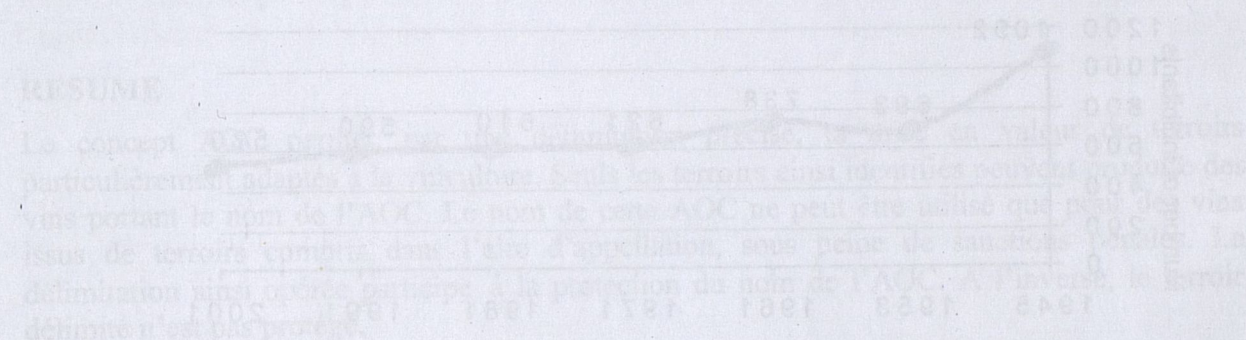
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STATISTICAL ANNALS DZS, several years

Alcohol	10.0
Extract (without sugar)	0.5-1.0
Total acids (such as vine acid)	0.5-1.0
Glycerol	2.5-3.5
2,3 Butandiol	0.5-1.0
Asins	0.5-1.0

Figure 1. The population of Motovun in the period between 1945 and 2000 years  
Key Words: Drought, protection.



RESUME  
Le concept de «zone agricole protégée» (ZAP) est une notion qui a été introduite en France en 1990. Elle a pour but de protéger les zones de production agricole qui sont menacées par des pressions extérieures. Cette notion est définie par la loi n° 100 du 19 mai 1990. Elle est destinée à protéger les zones de production agricole qui sont menacées par des pressions extérieures. Elle est destinée à protéger les zones de production agricole qui sont menacées par des pressions extérieures.

Pour cela, il est nécessaire de définir les zones de production agricole qui sont menacées par des pressions extérieures. Cette notion est définie par la loi n° 100 du 19 mai 1990. Elle est destinée à protéger les zones de production agricole qui sont menacées par des pressions extérieures. Elle est destinée à protéger les zones de production agricole qui sont menacées par des pressions extérieures.

Sample	Depth	pH	pH	K <sub>2</sub> O (g/kg)
I	0-30	7.0	7.0	1.0
	30-60	7.0	7.0	1.0
	60-90	7.0	7.0	1.0
II	0-30	7.0	7.0	1.0
	30-60	7.0	7.0	1.0
	60-90	7.0	7.0	1.0
III	0-30	7.0	7.0	1.0
	30-60	7.0	7.0	1.0
	60-90	7.0	7.0	1.0

En aucun cas, les décisions ne doivent être conformes aux avis rendus.

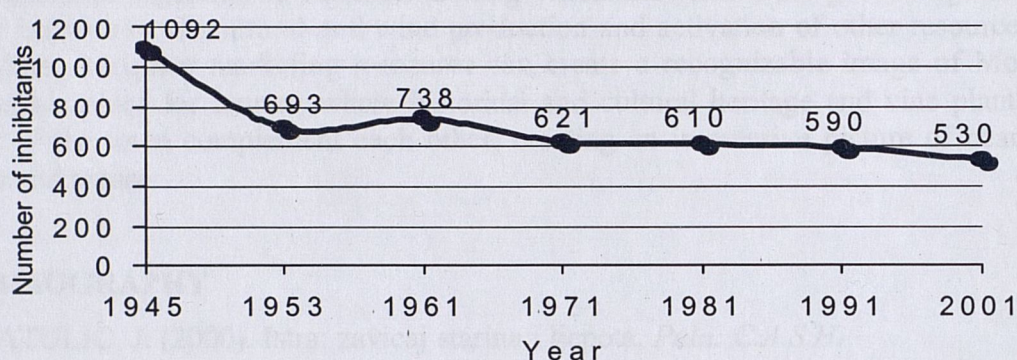
Récemment, le législateur a créé la notion de «zone agricole protégée» destinée à limiter les autorisations de construction dans ces zones. Mais, aucune ZAP n'a encore été créée.



Table 1. Range of basic analytical parameters for teran wine

Indicator	Unit	Value
Alcohol	vol %	10,0 – 12,0
Extract (without sugar)	g/l	21,0 – 31,0
Total acids (such as vine acid)	g/l	6,5 – 10,0
Glycerol	g/l	5,5 – 9,5
2,3 butandiol	g/l	0,4 – 0,95
Ashes	g/l	2,0 – 3,5

Picture 1. The population of Motovun in the period between 1945 and 2001



Source: Statistical annals DZS, several years, Cadastre national de l'Istrie, 1946, Susak, for the year 1945

Table 2 - Chemical structure of soil on the flysh in the 0-60cm layer

Sample	Depth cm	pH u H <sub>2</sub> O	pH u KCl	P <sub>2</sub> O <sub>5</sub> mg/100g	K <sub>2</sub> O mg/100g	Humus %
I	0-30	7,0	7,0	5,8	48,9	1,26
	30-60	7,9	7,9	4,9	43,2	0,9
II	0-30	7,1	6,3	6,8	60,6	1,72
	30-60	7,9	6,9	4,8	37,2	1,29
III	0-30	6,5	5,7	5,3	40,0	1,48
	30-60	6,7	5,8	4,8	39,1	0,41