Geographical data

The Timisoara Municipality lays at the intersection of the parallel 45°47' North latitude with the meridian 21°17' East longitude, located, as a mathematical position, in the Northern hemisphere, at distances almost equal between the North Pole and the equator, and in the Eastern hemisphere, in the time zone of the Central Europe. The local hour of the city (considered as meridian) is 1 hour 25' 8'' ahead of the meridian 0, Greenwich, and 34'52'' arrear of the official hour of Romania (the hour of Oriental Europe).

The Timisoara Municipality is located at an average distance of about 550 km to the capital of Romania - Bucharest and of about 170 km and 300 km to Beograd and Budapest, which are the capitals of our two neighbouring countries Serbia - Montenegro and Hungary, respectively.

Surface Area

According to the data received from the Timis Agency for Cadastre and Real Estate Publicity, the Timisoara Municipality has the following Agricultural Real Estate (in 2004):

The total surface area of the Timisoara Municipality is of 12,926.83 ha, of which 7902.61 ha arable land and 5024.22 ha non-arable land;

The surface of 7902.61 ha agricultural land comprises: 7130.57 ha arable land; 425.57 ha pastures; 223.25 ha hay-fields; 39.20 ha vineyards; 84.02 ha orchards.

The surface of 5024.22 ha of non-agricultural land comprises: 649.08 ha forests; 317.31 ha waters, ponds; 2920.36 ha constructions; 1062.51 ha roads; 74.96 ha unproductive land.

Of the arable lands (7130.57 ha) found within the Timisoara Municipality about 73% are private property, and of the private properties (5171.48%), 21% are administered by U.S.A.M.V.B. - The Didactic Station of Timisoara (1529.83 ha), the arable lands are the property of Timisoara City Hall (175.13 ha) representing 2.45%, and the remainder of 3.55% of the arable land are owed or administered by other units (The Ministry of Waters, Forests and Environmental Protection, the Ministry of Interior, etc.).

Pastures (with a total surface of 425.57 ha) within the Timisoara municipality are formed mostly of pastures held by the municipality - and administered by the Local Council of Timisoara Municipality - with a surface of 290.22 ha, representing 62% of the total surface area of pasture within the Timisoara municipality, and the remainder of pasture being private property - 19% (84.93 ha) or administered by some institutions (Timisoara City Hall, the Ministry of National Defence, Herghelia,
Utilitarian Aviation - 19% (50.42 ha).

The pasture surface of 290.22 ha lies over three districts of the municipality - some of the activities of the people living in these areas are the zootechnical activities (livestock husbandry - bovines, caprinas, sheep, etc.). These areas (or districts) are Ciaarda Rosie (22.18 ha), Freidorf (63.36 ha) and Mehala (204.68 ha). As per the Decision no. 342/22.02.2002 of the Local Council of the Timisoara Municipality, the pasture in the Freidorf area will become a forming part of the industrial area of the municipality.

**Relief**

Timisoara lies to the south-east of the Pannonian Basin, in the divagation area of the rivers Timis and Bega. This is one of the fewest places where people could cross the wide swamps formed by the waters of the two rivers, which up until 250 years ago, every spring, they would flood the subsident field between Campia Buziasului and Campia Vingai.

In general, the relief of the Timisoara area is of a remarkable monotony, as the evenness of the fields is only interrupted by the shallow bed of the river Bega (manmade bed, through canalization). Nevertheless, seen in detail, the relief of the city and of its surroundings feature a series of local particularities, altimetrically expressed through gradients, even though some modest ones, which do not exceed 2-3m.

In the precincts of Timisoara, the highest quota is in the north-eastern part, in the district called 'Intre Vii', at 95m. and the lowest point is at 84m, to the west of the Mehala district (Ronat). Over a distance of about 7 km East-West, the level difference is of about 11m. from North to South, over a distance of about 5km, the city level gradually decreases by 10 m. The precincts of the city superimposes the alluvial plain, with its slightly raised edges, developed along the Bega river. If we should consider the whole area, the differences of level and the relief forms are more varied. Thus, the maximum altitudes exceed 100m to the North-East and almost reach this level to the South-East and to the North-West: Slatina Mare (109m) to the North-East and Dealul Flamand (98m) to the North-West. The lowest quotas are located west to the Freidorf district, at 87m.

The relief of the administrative territory of the city and of the periurban towns is a part of the Campia Timisoarei and comprises the following main units:

To the north and northeast, there is the Highlands of Giarmata Vii - Dumbravita, with an average height of 100m.

To the north-west, there is the Lowlands of Torontal, with an average height of 88m, which unites with the precincts of the city through the plain of Cioreni;

To the east, there is the alluvial plain of Bega, with an average altitude of 90-95m, and sandy and clayey soils, affected by the gleization.
To the south, there is Bega-Timis, with altitudes which decrease from the North to the East and from the South to the West, from 96m to 91m.

From a tectonic point of view, Timisoara is located in an area with faults oriented from East to West, marked by the presence of the extinct volcano of Sanovita, as well as by the mineral waters of Calacea, to the North of Timisoara, and Buzias-Ivanda, to the south.

The seismological studies carried out ever since the last decades of the 19th century and up until now, show that Banat is a region with plenty seismic centres, which can be grouped into two areas: one in the southeastern part of the region and the other in the immediate proximity of Timisoara city.

Near Timisoara, there are the seismic lines Periam-Varias-Vinga, which intersect each other to the north-west and those of Radna-Parta-Sag, to the southeast. There is also a secondary hotspot right beneath the precincts of Timisoara.

Timisoara is a fairly active seismic hotspot, but of the numerous earthquakes monitored here, very few exceeded the magnitude of 6 on the Richter scale. The historical data show us that before 1901 there were 217 earthquakes registered (the fiercest one was one in 1879); in the period 1901-1950, there were reported 129 earthquakes, and in the period 1950-1999, there were 97 earthquakes, producing minor damages to old buildings. The most important seismic movements stroke the city in 1991 (12th of July M = 5.7; 18th of July M=5.6; 2nd of December M=5.5). It seems that the most powerful one in the Banat area was on the 10th of October 1879, at Moldova Noua, with an intensity of VIII and plenty aftershocks.

The earthquakes in Banat are characterized by the shallow depth of the hotspot (5-15km), the reduced influence area around the epicentre, short-term horizontal and vertical movements of the impulse type, and long periods of recovery in the same area. These types of earthquakes affect moreover rigid structures (mason works, diaphragms, great panels) and less, those more flexible (frames of reinforced steel or metal).

Regarding the geological structures of the area, there are quaternary deposits of about 100m in thickness, under which there are successions of Roman deposits - up until 600 m in depth - and Dacian deposits in facies lacustru and swamp, who favoured the formation of numerous layers of lignite. They are followed by the Pontic and Sarmatian formations and from 1740m downwards, there is the site of the crystalline shield.

As a consequence of the petrographic of the surface formations, on the land of Timisoara, there were registered settlement phenomena due to the sandy-clayey substrate.

The phenomenon can especially be seen in the districts Cetate and Elisabetin, as well as in other parts, where there appeared some steppe-depressions (Ronat).
Climate

Timisoara has a moderated continental-temperate climate, characteristic to the south-east part of the Pannonian Depression with some Submediterranean influences (the Adriatic variant).

Its general traits are marked by the diversity and irregularity of the atmospheric processes.

In springs and summers, the temperate air masses are the dominant ones, of oceanic origin, which bring some considerable quantities of precipitations. Frequently, and even in winters, there are wet air masses which come from the Atlantic Ocean, which bring considerable rainfalls and snowfalls, and rarely low temperature waves.

From September till February, there are frequent considerable penetrations of continental polar air masses, coming from the east. Nevertheless, in Banat one can also sense significantly the influence of cyclones and masses of warm air from the Adriatic Sea and the Mediterranean Sea, which generate in the winter a complete defrost and in summer, very high temperatures.

The yearly average temperature is of 10.6°C and the hottest month of year is July (21.1°C), leading to an average thermal amplitude of 22.7°C, below that of Campia Romana, which attests the beneficial influence of the oceanic air masses. Practically speaking, the number of the days with temperatures favourable to the optimum development of crops, that is, the ones with average temperatures of over 15°C, is of 143 days per year, comprised between the 7th of May and the 26th of September. The active temperature, totalizing 2761°C, provides very good conditions for the maturation of crops, including some of Mediterranean origin.

Found predominantly under the influence of the maritime air masses coming from the North-West, Timisoara gets a quantity of precipitations greater than the cities in Campia Romana. The yearly average, of 592m, close to the average of the country, is especially achieved from the abundant precipitations of the months of May, June, July (34.4% of the yearly total) and of the months of November and December, when it was register a second maximum value, as a consequence of the Submediterranean climatic influences. In the period favourable to agricultural crops, almost 80% of the precipitations are falling, and this is a condition favourable to the development of autochthonous crops. Nonetheless, the regime of precipitations has an irregular character, with years with more abundant precipitations than the average and then again, with years with very little quantities of precipitations.

Due to its positioning in open plain, but at distances not very long from the Carpathian massifs and from the main valley corridors which separate them in this part of the country (Timis-Cerna corridor, Mures valley, etc.), Timisoara registers, from the north-west and west directions, a movement of the air masses which is slightly different than the general circulation of the air above the western part of Romania. The local canalizations of the air circulation and the instable balances among the baric centres require a great variability of the wind frequency on the main directions.
The most frequent ones are the north-west winds (13%) and the west ones (9.8%), as a reaction to the activity of the anticyclone of the Azores, with a maximum extension in the summer months. In April-May, a greater frequency is also registered with the south winds (8.4% of the total). The other directions have reduced frequencies. As intensity, sometimes, winds reach the degree 10 of the Beaufort scale, the cyclonal type of storms are always coming from the west, south-west (1929, 1942, 1960, 1969, 1994). The distribution of the dominant winds affect, to a great extent, the air quality of the Timisoara city due to the pollutants produced by the industrial platforms in the west and south of the city, which are drawn in the air. Their stagnation in the air is facilitated by both the general morphology of the cuvette-like precincts and the significant weight of the doldrums (45.9%).

Hydrography

The territory of Timisoara has a rich hydrographical network, formed by rivers, lakes and swamps. Except for the Bega and Timis rivers, the other rivers often dry up in the summer.

The main stream of water is the most southern tributary of Tisa. Springing from Poiana Rusca Mountains, Bega is canalized, and from Timisoara up to its mouth, it was arranged for navigation (115km). Bega canal was built in the period 1728-1760, but its final arrangement was only later performed. To regularize the debit within the limits which should allow the performance of the functions for which it was designed, a hydrotechnical node was built at Costei. Its main function is to regularize the debit and to ensure the water transfer from Timis into Bega, depending on the necessities and the amount of precipitations taken over by the two rivers upstream. The Bega canal was designed for the access of the barges of 600-700 tons and a yearly transport capacity of 3,000,000 wagons. To avoid the danger of flooding, so frequent in the past, the work was completed subsequently with the hydrotechnical system at Topolovatul Mare, through which, in the periods with significant rainfalls, the debit surplus registered by Bega is directed to the Timis River.

Of the numerous branches exiting before the canalization of Bega, inside the city were only kept Bega Moarta - Dead Bega
- (in the Fabric district) and Bega Veche - Old Bega
- (to the west, flowing through Sacalaz).

On the territory of the city there are also plenty of lakes, either natural or formed in place of the old meanders or in the detached areas (such as those by the Kuntz colony, close to Giroc, Lacul Serpilor (Snakes Lake)
) in Padurea Verde - Green Forest

), or of anthropic origin (to Fratelia, Freidorf, Mosnita, Mehala, Strandul Tineretului, etc.), remarkable by their location on the contact line with the periurban towns.

From the point of view of the underground waters, the phreatic layer of Timisoara is at a depth, which ranges from 0.5 to 4m. The depth water layers are more and more numerous from North to the South, from 4 to 9m -
Flora and fauna

Flora

From a geobotanical point of view, Timisoara can be included in the category of the oak forests, deforested by man in the past to obtain the wood necessary for the erection of the citadel and dwellings, as well as to gain new arable lands.

Currently, except for some areas with woods of cerris -Turkey oak- and garnita -Hungarian oak- (Padurea Verde, Padurea Bistrița, padurea Giroic, Sag), the territory of Timisoara is included in the anthropogenic forest steppe, which characterizes the whole Pannonian Plain.

The landscape is even more varied by the meadow vegetation along the main rivers, where predominate softwood trees.

Noteworthy is the presence of the dendrological park of Bazosul Nou: forest reservation with a surface of about 60.4 ha, located at about 15 km to the South-East of Timisoara, on the territory established from the proper reservation (17.8 ha) and the buffering area from around the reservation.

Fauna

The fauna of the forests comprises very little mammals, represented only by a few insectivores and rodents. Instead, birds are quite numerous, some of them, of cynegetic value (pheasant).

The fauna of the forest steppes and steppes, although less varied than that of the forests, has a greater number of species of cynegetic interest (rabbit, dear, quail, partridge, pheasant, etc.).
The piscicultural fauna is dominated by the carp species, but there are also flounders, bleak, roaches, *sebita*, pikes, which are a natural support for sportive fishing.

The increasing human pressure in the periurban space of Timisoara has negative consequences upon the fauna, as the destruction of spontaneous biotopes and their replacement with crops inevitably affect the biocenoses.

Soils and subsoil resources

? Soils

The soil in the area of Timisoara is of a great diversity, many types and subtypes being included in the classes: cernisoils, luvisoils, argilluvisoils, cambisoils, hydrisoils, pellisoils, vertisoils and protisoils. The general capacity of sustaining the agricultural production, as a consequence of the increased weight of certain soils with a poor natural fertility or affected by flooding (enticambisoils, gleiosoils, stagnosoils, vertisoils), compensated, however, by the presence of the chernozems and mollic preluvosoils, with a remarkable weight in the area of the towns of Sacalaz, Dumbravita and Sanmihaiu Roman.

Nevertheless, in Campia Banatului predominate the soils of an increased fertility (chernozems, cambic and argic calcareous soils, mollic preluvosoils, etc.), without any significant restrictions in exploitation, and thus, representing an important natural resource for the development of the intensive agricultural production.

? Subsoil resources

The resources of thermal-mineral water from Timisoara and its surroundings (Calacea, Buzias, Ciacova, Ivanda etc.) are traditionally capitalized. In the post-war period, the resources of hydrocarbons, oil and its related gases were also valorised at the exploitation centres, dispersed to the northwest and west, in Campia Vingai and Campia Arancai.