

HYDRO-CLIMATIC EVENTS DURING THE LITTLE CLIMATIC OPTIMUM IN ROMANIA

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Hydro-climatic events during the Little Climatic Optimum in Romania. Our knowledge of the climate during the Little Climatic Optimum (8th–14th centuries) in this country comes from some historical studies of climatic events occurring in countries around or near Romania (Hungary, the Italian Peninsula, Ukraine, the Balkan Peninsula and the region around Constantinople), found in foreign chronicles, French, German, and Russian, as well as in some notes of foreign travellers in that territory. The records speak mostly of harsh winters, especially early in the interval considered, with rivers and the Black Sea frozen, or rainy summers, with floods, but also of some very warm winters, with tree in blossoms in January, and long, hot and dry summers. Some of these extreme events led to famine, pestilence, and high morbidity.

1. INTRODUCTION

After the last glaciation, the climate on Earth began gradually to warm up.

Historical climatology reveals periods of heating across Europe alternating with periods of cooling, outstanding being the Mediaeval Warm Period (Little Climatic Optimum) (between AD 750 or 800–900 and 1100–1200 or 1300) followed by the Little Ice Age (between 1300 or 1350 and 1850).

Researchers consider a difference of 0.5–1°C average temperature between the cold and the warm periods. However, within a few hundred years of warm period, numerous harsh winters or rainy and cold summers set in, just like in a cold period mild winters and hot, dry summers can be recorded.

2. SOURCES OF INFORMATION ON THE CLIMATE OF PAST CENTURIES

All information about prehistorical and historical climate use data from “the archives of nature”: glaciers, terrestrial and marine sediments, tree rings and sporopollenin analyses.

Data from the “archives of society” are also used: archaeological remains, data on different vegetation phases, remarks about hydro-climatic phenomena: floods, frozen rivers and seas, snow data (early, late, and snow depth), drought and others. Local archives speak about the value and price of crops, found in parish and monastic registers, royal and harbour registers, religious or secular books, calendars, and in chronicles, letters, travel journals, reports by officials, etc. (Pfister 1999).

According to sources, the limit of hot or cold periods is different (Table 1).

Some past hydro-climatic events in Central Europe and the areas around the Black Sea, recorded by different historians, can be referred also to regions around the Carpathians. Researchers such as Arago, Angot, Hann, and Hennig used ancient sources: Latin historians: Titus Livius, Strabo, Tacitus, Zosimus, Teofanus and German, French, and Russian mediaeval and other chronicles.

Romania’s past historical conditions were not favourable to the building of a stable society until the 13th and 14th centuries, when the Romanian Countries were founded. Therefore, our knowledge on the climate of past centuries in this territory is virtually absent until the 13th century. So, we could not exactly reconstruct the climate of the Middle Ages, but we may infer it.

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To get an image of the Little Climatic Optimum in Romania we used climate data about Europe recorded by Ch. Easton (1928) for Western Europe and C. Mihăilescu (2004), who offers additional data provided by Russian researchers, based on mediaeval Russian chronicles; Ch. Lebeau's work (1831) on the Byzantine Empire; N. Topor (1964), recorded by Western sources; P. Cernovodeanu and P. Binder (2003), who resorted to German and Hungarian sources, especially for Transylvania.

Table 1

The climate of the past two millennia

After Blytt (1876), Sernander (1908), based on studies of palynology in Danish peat bogs (Agostini and others 2005) :	After Emm. Le Roy Ladurie (2008), based on historical studies:
– AD 100 BC – 400 – warm and dry – AD 400–750 – cold – 750–1200 – warm – 1200–1350 – cold – 1350–1550 – cool – 1550–1850 – very cold – 1850–1950 – warm – 1950–1975 – cold (from 1975 – warm episode)	– AD 400 BC–200 Little Climatic Optimum, (<i>“the beautiful centuries” of the Roman Republic</i>) – AD 270–600 little Ice Age, (<i>the decay of the Roman Empire and ruinous invasions of Germanic tribes.</i>) – 800–900 – 1100–1200 or 1300 – the medieval warm (Little Climatic Optimum) 1300 or 1350 – 1850 – Little Ice Age – 1850 – to date – warm period (1950 – 1970. – short cooling period)

3. SOME HYDRO-CLIMATIC EVENTS BETWEEN the 8th – 10th CENTURIES

We have no historical climatic information on this interval connected strictly to the southern territories that would later become the Romanian Countries. There are some foreign historians who recorded events in neighbouring regions around the Carpathians (the Balkan Peninsula, Constantinople region, the Italian Peninsula, areas around the Black Sea or in Central Europe and the plains of Ukraine), which might suggest similar climatic conditions.

Although researchers dealing with climate variations place the beginnings of the Little Climatic Optimum around AD 750–900 (Le Roy Ladurie 2004; Agostini and others 2005), information on cold winters in that period are more numerous than about warmer winters. This might be due to the high frequency of cold winters after the last major glaciation, or to people bearing harsh winters with greater difficulty, and therefore they are better remembered by society. Consequences in these cases (famine, epidemics, and high mortality) generally last much longer in the memory. If the winter is mild, short, with little snow, it usually has fewer consequences and is easily forgotten.

Before AD 800 most information relate to harsh winters: 717, 768, 786, 791, 794–795 and especially to “one of the major winters ever known” (Easton 1928), i.e. 763–764, when “all wars, even all civil affairs were suspended by excessive cold which made one think of the total disappearance of people and animals” (Lebeau 1831). Numerous German, French, Dutch, and English sources mention it in greater detail or in brief. That winter was exceptionally severe throughout Europe; in Constantinople, the Black Sea was frozen from October to March, and in spring floes reached the Aegean Sea. In Romania warm winters were few: in 739, 767 and 776.

After AD 800 cold periods were still numerous. The Black Sea froze in 800, 801, 858–859, the Adriatic in 850, 859 and 864 (the Venice lagoon froze and carriages could be driven on ice), in 821 all the rivers of Europe, the Rhine and the Danube in 822. Some of these extreme events brought famine

(very rainy spring in 801, and all the year was barren) with high mortality among people and animals because of hunger and cold (in 859–860, frost lasted from November to April, even in Italy, so that all seeds died, vines dried and wine froze in pots).

There is a lot of information about harsh winters *in the next century*, too. Thus, in 932–933 a frosty winter froze the Black Sea, in 943 and 981 harsh winters throughout Central Europe; in 992, a long and frosty winter in Southern Europe. Some records are questionable, for example, on July 15, 993, lakes froze and all fish were dead in Germany.

The terrible storm of 906 in Constantinople, with south-west winds that uprooted trees, destroyed houses and churches. In 907 and 979 major droughts in Ukraine, 981, a summer drought in Russia, 945 large spring floods in Kiev (the oldest evocation of a flood on the Dnieper River).

The year 994 was exceptionally hot and almost all rivers in Europe dried up in summer. Some of these phenomena produced disastrous epidemics, death and famine.

The above information suggests that in Eastern Europe the Little Climatic Optimum did not begin in the 9th and 10th centuries, but 100–200 years later than in Western Europe. In the West there had been some warmer periods, such as the 800–801 warm winter, followed by the plague; 807–808 and 838 were rainy winters (from January to March it thundered and “a scorching sun perched the earth”, Easton, 1928); 843–844 mild winter; 863, warm, rainy, windy winter; 872 hot and very dry summer; 999 and 1000 two very hot summers, with unheard of droughts, waters and springs dried up.

4. HYDRO-CLIMATIC INFORMATION IN THE 11th CENTURY

The regions around Romania experienced harsh winters in 1008, 1010, 1020, and 1035; 1060, a hard winter in the Lower Danube; 1077, frosty winter in Eastern and Central Europe. A frozen Black Sea in 1008, 1011 and 1076; in 1011 the Bosphorus was in the same situation.

Dry years (especially dry summers) were 1008, 1017, 1024, and 1035 (in the East it did not rain for 6 months), 1037 (over 6 months of drought in Thrace and Macedonia), and 1067.

Rainy summers: 1009, 1012, 1015, 1016, and 1020, with floods: 1012 (the Danube), 1093 (the Dnieper), 1096 (around Constantinople). Many of these events resulted in compromised crops, invasion of locusts, famine, pestilence and high mortality.

5. HYDRO-CLIMATIC INFORMATION IN THE 12th CENTURY. THE APEX OF THE LITTLE CLIMATIC OPTIMUM?

Most information generally speak of cold winters, which usually make peoples' life difficult. Cold periods: 1100, hard winter in Thrace; 1133, cold winter in Italy and Hungary; 1044, snowy winter in Kiev; 1167–1168 frozen Black Sea.

Rainy summers and floods: 1108, floods in Russia (around Kiev), 1150 (the Danube), 1156, floods in all European countries, 1162 and 1164, floods (the Dniester), 1193, floods in the upper Danube region. In 1177, warm winter in Russia.

Some exceptional hydro-climatic events were being recorded in the Romanian Countries which justifies listing this century in the Mediaeval Warm Age. For example, the hot summer of 1136 in the West Plain dried up the rivers; a hot dry summer also in 1142, many people died of hunger.

In 1186, trees flourished in January, birds laid eggs and at the end of the month apples were no bigger than nuts, and the warm weather made all crops develop quickly. Some of these exceptional events brought again famine, epidemics, and high mortality rates.

6. SPECIAL EVENTS IN THE 13th CENTURY

Some remarkable events were recorded on the territory of the Romanian Countries and associating them with information on the surrounding countries gives a clearer profile of the climate at that time.

- 1209–1210, a terrible winter throughout the Balkans, the Black Sea was frozen.
- 1216 a rough winter in Italy, the Po River froze, so did the wine in cellars; the weather was frosty also in the east, followed by a rainy summer with epidemics, poor harvests, and famine.
- 1223–1224, Russia experienced an unprecedented drought, forests and swamps burned “we all went across a dried Dnieper” (Russian Chronicle, quoted by Mihăilescu 2004). After two years of droughty weather, rainfall made all crops rot in the fields and famine raged throughout Russia.
- 1225–1226, on December 6, pastures flourished in Transylvania.
- 1232, the Bosphorus froze, and the summer was rainy: in July–August, the Danube overflowed. A hard winter, the wine froze in cellars; a frozen Black Sea and Adriatic Sea in 1234.
- 1234–1235, rainy summer with floods in the Danube basin; 1236, harsh winter across Western and Central Europe, frozen rivers, “Our old Danube River froze to the bottom” (Hepites quoted by Topor 1964), there followed five months of drought in the warm season.
- Winter 1241–1242, much snowfall, terribly cold at Christmas time, the Danube was frozen, and cold spread to southern Europe, in Italy the Po froze. Famine caused by poor harvest and augmented by terrible Tatar plunder was followed by a great epidemic, probably the plague, which made many victims. Famine and plague lasted until 1245, with repercussions in Transylvania and south of the Carpathians, “Cumania” (Wallachia) “remained almost depopulated” (Cernovodeanu, Binder 1993).
- 1246, frosty winter in Central Europe and in Ukraine, “... many horses perished because the snow was so deep that they could not get the food under it”; in his journey to the Mongolian Empire, the papal legate Plano Caprini (1182–1252) was forced to cross the Dnieper on ice (Mihăilescu 2004). The Black Sea was frozen more than three miles off shore. In 1247, there was much snow in Kiev Principality. In 1254, the Danubian Countries experienced severe frost in January. In 1267–1268, between Christmas and Epiphany, the middle Danube sector was flooded in winter; 1270, cold winter in Central Europe (Bohemia, and Hungary), in Novgorod, the snowfall of March 25 covered many courtyards and people; 1280, big Danube floods.
- 1288–1289, trees were blooming at Christmas time, and vines blossomed in April. In that exceptional winter, children bathed in the rivers and harvesting took place two months earlier than usual (Zolnay, cited by Cernovodeanu, Binder 1993). 1298 was a very droughty year, with forest fires in southern and central Russia. In 1299 there was little rain in summer, poor yields over a vast territory in the east.

7. THE 14th CENTURY. THE LITTLE CLIMATIC OPTIMUM AT THE END

Since some researchers have extended the Mediaeval Warm Period beyond 1300, we also have recorded some special events of that century.

In 1300, 1301, 1302, and 1304 winters were generally mild and short, no snow; in 1301 trees were blooming in January, summers were hot, and dry; in 1304, the Danube could be crossed on foot.

A very cold winter in 1304–1305, the Black Sea was frozen. In 1312, flooding on the Danube. Major floods in 1317 followed by a big epidemic, probably the plague, in Transylvania and Wallachia, with a steep demographic decline; the epidemic spread across Europe (“the Black Plague” from 1348 to 1350) (Cernovodeanu, Binder 1993). In 1322–1323, the Black Sea shores were frozen. 1327 was a

mild winter year; in the West Plain trees were in flower in May, in the first August days harvesting began.

In 1330–1331 (or 1333–1334), the Arab traveller and geographer Ibn Battutah (1304–1377 ?), accompanying a Byzantine princess to Constantinople, passed through Dobrogea and described that winter as follows: “It was then in the midst of winter. I put on three coats and three pairs of pants, ... had woollen footwear, a double lined hamp pair over it and ... a third, fur-lined pair ... When I was washing my face, the water ... turned into ice and if I was shaking my beard, white frost fell from it ... I could not get on horse because of my many clothes, so my companions had to push me on horsedback” (Brătescu 1923).

1338–1340, locusts caused havoc from Bârsa Land to Lipova Land, summer rains drove them away, but still there was famine. 1341, a mild winter in Central Europe, but drought, famine and epidemics in the east. It seems that the winter of 1343 was warm, and very droughty.

1346, 1347, 1348, 1349, and 1350 maximum rainfall in summer, very cold winters, poor harvests, famine, and plague in the east.

1363, droughty, poor crops, and famine. In the West Plain, the Hungarian King Louis I of Anjou ordered his governors to go from house to house, to record the inhabitants’ grain reserves and sell the surplus in the market (Cernovodeanu, Binder 1993); 1367 was a mild winter.

1370 was a rainy year, with big floods. In 1371, Russia had a mild winter, the hot and dry, droughty summer dried up rivers, lakes, and swamps; forests and peat bogs were burning.

1387 was a very hot and dry summer, in Switzerland and Central Europe it rained only 6 times from February 28 to September 19. Heat was so great that even after several hundred years, that summer is remembered as “the old hot summer” (Easton 1928). In contrast, Russia experienced big summer flooding.

In September 1396, Peter von Rez (? – 1396), a German knight participating in the battle of Nicopolis alongside King Sigismund of Hungary, wrote: “The wind was blowing and it rained heavily, and we had to cross a big water (probably the Olt) and many people drowned then. They (the local Vlachs) pulled down the bridges in front of us, we had to run all crazy through high mountains and along some bad paths, through large forests and among fierce people ... People were dying of hunger and cold... It took over seven days” (*Călători străini*, 1968).

In 1399 severe winter throughout the Danube basin. Did the Little Ice Age begin?

8. CONCLUSIONS

The period spanning the 8th–9th and 13th–14th centuries, called the Medieval Warm Period or the Little Climatic Optimum, started probably earlier in Western Europe than in Eastern Europe. Besides, the expansion of the Vikings to Greenland and farther on to the American continent is explained in part by climate warming in North-Western Europe at that time.

Presumably, the Little Climatic Optimum in Eastern Europe had lasted for some 100 years.

Information on that period is limited and does not enable a general climatic characterization or tendency to heating or cooling either. Also, some information are too general, both in time and space: hard winter, but where? or dry year, but we do not know whether in summer or in winter? (Teodoreanu 2007, 2012)

There were numerous harsh long winters and much snow in many years, when sea and rivers would freeze; also cold or rainy summers and floods, especially in the first part of the period. However, some winters were very warm, e.g. 1186, 1288–1289, 1327, 1341, 1343, 1367, 1371 and 1387, as were summers hot and dry: 1008, 1017, 1024, 1035, 1037, 1067, 1136, 1142, 1223, 1298–1304, 1363, and 1387.

It should be mentioned that weather in Eastern Europe was not always similar to that in Western Europe. For example, in 801, the Black Sea froze, but in the West the winter was warm; in 1116, at Christmas time, they would gather fresh strawberries, as a chronicle of Liège tells us (Jouzel, Debroise 2004), but no information about Eastern Europe; in 1387, it was hot and dry in Central Europe, but big floods in Russia, etc.

However, some periods were similar throughout Europe, for example the harsh winter of 1020, or a warm year 1300–1301–1302.

Generally, normal times were not mentioned, except in rare cases, because anyway they had been easily forgotten.

We can appreciate temperature and precipitation values only very approximately, as found in written sources (flowering trees in winter, which indicates long positive temperatures), or flood water level on the city walls, as known in some French cities.

Perhaps further research will provide more information and clarifications of the climate of Europe during the mediaeval warm of the 8th–14th centuries.

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COMPARATIVE CLIMATIC CHARACTERISTICS BETWEEN THE WINTER OF 2011–2012 AND THE WINTER OF 1953–1954 IN THE SOUTH OF ROMANIA

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Key-words: climatic hazard, snowstorm, severe winter phenomena, snow layer, Oltenia.

Comparative climatic characteristics between the winter of 2011–2012 and the winter of 1953–1954 in the south of Romania. The authors makes a comparative analysis of the typical climatic evolution in two winter season: 2011–2012 and 1953–1954, the latter interval representing a 20th-century risk-high record. The beginning was January 25, 2012 when, after an excessively dry autumn, the weather would change all of a sudden. The first two warm winter months, which had lasted until January the 24th 2012, were followed by true winter weather between January 25 and February 15, when temperatures dropped below -20°C, associated with heavy snowfalls, snowstorms and strong winds (70–80 km/h) that blew and drifted the snow with disastrous effects for Romania's south-east counties, in particular. National losses: disrupted traffic of all types, snow-blocked households and animal shelters, black-outs, closed schools, difficulties in conducting supply and salvage operations for the population, etc. Although the harsh weather lasted only 25 days (blizzards, 40–135 cm-deep snow cover, 2–3 m-high snowpacks), yet the picture was partly similar to the 1953–1954 winter season which remains the severest one not only in the 20th century, but in the whole history of meteorological observations in Romania.

1. INTRODUCTION

The extremely droughty and excessively warmish first half of autumn 2011 was followed by the warm winter of 2011–2012 in December and in most of January. Then, the radical change of the thermal regime, starting with 25 January 2012, marked an extreme climatic anomaly, during which (25 January 2011 – 15 February 2012) the excessive 21-day frost caused the death of many people not only in Romania, but also throughout Europe. This type of climatic evolution caught most of the population unprepared. As a result, there were not only human casualites, but also significant material damage. In view of it, this winter was the severest one since the beginning of the 21st century, and yet according to the history of meteorological observations in Romania, it is the winter of 1953–1954 that holds the record, as presented in what follows.

2. DATA AND METHODS

This paper is based on the analyses of statistical data supplied by Oltenia Regional Meteorological Centre, the results of daily processing with a special weather forecast software, synoptic maps currently produced by operational activity, and those on the Internet provided by the analysis and forecast of international centres and the Bucharest National Meteorological Administration (NMA), as well as the facilities offered by the MS Office for the elaboration of tables

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and charts. A comparative analysis of the main elements and meteorological phenomena is made for each month of the two winters.

3. CLIMATIC CHARACTERISTICS OF WINTER 2011–2012

3.1. The thermal regime of December 2011

In December 2011, *air temperature means* in Oltenia were of -1.2°C at Voineasa station (Voineasa Intracarpethian Depression) and 3.6°C Calafat Station, with deviations from the multiannual means of 0.7°C at Voineasa and 2.9°C at Băcleș. According to the Hellmann Criterion, in December 2011 the thermal time type¹ at the weather stations of Oltenia ranged between normal (N) at Voineasa and warm (W) at most of the other stations. The monthly temperature mean for the entire region was 1.8°C , with deviation from the multiannual mean of 1.9°C , which classifies December as a warmish month (WS) throughout the region (Table 1).

Table 1

The air thermal regime in December 2011: normal (N); mean (M); deviation from normal (ΔT), Hellmann Criterion (CH), air minimum temperature (Tmin), air maximum temperature (Tmax) and minimum temperature on soil (Tmin Soil) in Oltenia, (Hm=altitude of station)

Weather station	Hm	N	M	ΔT	CH	Tmin		Tmax		Tmin Soil	
						$^{\circ}\text{C}$	Date	$^{\circ}\text{C}$	Date	$^{\circ}\text{C}$	Date
Drobeta Turnu Severin	77	1.4	3.2	1.8	WS	-6.0	2	16.7	4	-7.8	2
Calafat	66	1.0	3.6	2.6	W	-6.2	2	19.8	4	-9.4	1
Bechet	65	0.4	2.2	1.8	WS	-8.2	2	19.9	5	-8.0	1;2;3
Băilești	56	0.4	2.9	2.5	W	-8.2	2	20.1	5	-10	25
Caracal	112	-0.1	2.5	2.6	W	-5.4	1	17.9	4	-8.1	1
Craiova	190	0.1	2.3	2.2	W	-7.0	27	16.8	5	-6.0	1
Slatina	165	0.3	2.2	1.9	WS	-6.8	1	14.7	4	-6.7	2
Băcleș	309	-0.4	2.5	2.9	W	-6.9	24	16.5	5	-	-
Târgu Logrești	262	0.1	1.3	1.2	WS	-9.7	1	15.6	3	-10.7	1
Drăgășani	280	0.6	2.8	2.2	W	-6.0	27	13.6	11	-8.2	27
Apa Neagră	250	0.1	1.2	1.1	WS	-10.2	1	15.0	4	-10.2	1
Târgu Jiu	210	0.1	1.7	1.6	WS	-8.9	24	14.8	4	-10.4	1
Polovragi	546	0.1	1.9	1.8	WS	-7.4	24	13.3	4	-9.6	1
Râmnicu Vâlcea	243	0.5	2.4	1.9	WS	-6.5	24	13.5	11	-7.0	1
Voineasa	573	-1.9	-1.2	0.7	N	-12.5	24	11.2	5	-	-
Parâng	1585	-3.7	-2.0	1.7	WS	-12.6	24	7.9	2	-	-
Mean for Oltenia	-	-0.1	1.8	1.9	WS	-8.0	-	15.5	-	-8.6	-
Obârșia Lotrului	1348	-4.9	-3.5	1.4	WS	-17.5	22	9.1	1	-	-

Source: *Oltenia Regional Meteorological Centre, processed data.*

The maximum thermal values were all positive (11.2°C at Voineasa and 20.1°C at Băilești, both registered on December 5) (Fig. 1).

The monthly minimum air temperatures, recorded on different dates, ran between -5.4°C at Caracal (1 December) and -12.5°C at Voineasa (24 December 2011). At ≤ 250 m altitude, monthly minimum values were registered in the first part of the month during a cooling spell (1–2 December, followed immediately by weather warming), high-area values being registered during the cooling episode of 24–27 December (Table 1).

¹ According to the Hellmann Criterion, the thermal time type is: excessively warm (EW), very warm (VW), warm (W), warmish (WS), normal (N), cool (CO), cold (CL), very cold (VC) and excessively cold (EC).

The daily maximum temperatures were all positive in December 2011, all daily minima being positive only on 5, 6, 11–17 and 20, namely for 10 days.

The monthly minimum thermal values on soil surface, registered mostly in the first two days of the month, were of -6.0°C at Craiova on 1 December and -10.7°C at Târgu Logrești on the same date.

Within that interval the soil was frozen, it starting to thaw on 3 December.

Variations of daily average temperature values, as well as of daily minimum and maximum temperature means in December 2011 indicate a tendency to weather cooling (Fig. 1).

In that month, in the lower troposphere, at the isobar surface of 850 hPa (about 1,500 m altitude) there were 13 days of cold advections ($T \geq 0^{\circ}\text{C}$), 17 days of close-to-normal temperatures ($-10^{\circ}\text{C} \leq T \leq 0^{\circ}\text{C}$) and one cold day ($-14^{\circ}\text{C} \leq T \leq -1.5^{\circ}\text{C}$) (Table 2).

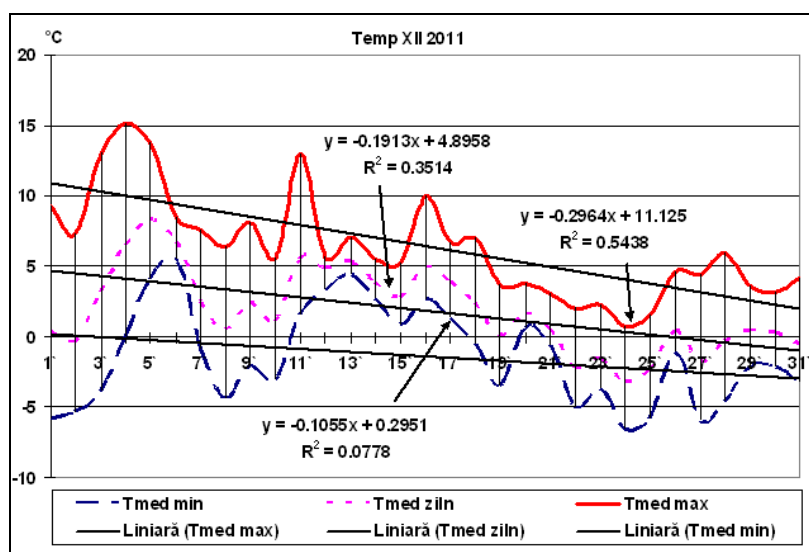


Fig. 1 – The variation of air temperature, daily means (Tmed ziln), daily minimum (Tmed min) and maximum temperature mean (Tmed max), calculated for the entire region in December 2011 and the linear (liniară) tendency of evolution.

Most of December 2011 was dominated by an anticyclonic regime (excepting the 11–22 December interval, when the Azores High coupled with the Mediterranean Cyclones), generated either by the Azores High itself or coupled with the North-African Anticyclone, or the East-European Anticyclone.

At the end of the month (20–26 December), there were a few light snowfalls, too (due to the interaction between the high air pressure belt formed of the ridge of the Azores High with the East-European Anticyclone and the Mediterranean Cyclones), which produced a discontinuous and ephemeral snow layer.

Table 2

Isotherms ($^{\circ}\text{C}$) at 850 hPa above Romania, 00 UTC, December 2011

Date	Isotherms	Date	Isotherms	Date	Isotherms	Date	Isotherms	Date	Isotherms
1	+1...+6	8	-4...0	15	2...6	22	-8...-5	29	0...+4
2	-1...+4	9	-6...-4	16	0...5	23	-8...-2	30	-5...0
3	+4...+6	10	0...5	17	0...5	24	-10...-5	31	-6...-2
4	+2...+6	11	0...6	18	-5...+1	25	-7...-4		
5	+4...+6	12	-2...4	19	-6...-2	26	-6...-4		
6	-2...+6	13	4...6	20	-4...+3	27	-1...0		
7	-4...0	14	2...5	21	-8...0	28	+1...+5		

Source: <http://www.wetterzentrale.de>.

3.2. The pluviometric regime of December 2011

The monthly quantities of precipitation registered in December 2011 were low and varied (12.0 l/m² at Bechet and 44.9 l/m² at Apa Neagră), with percentage deviation from normal values of -69.7% at Băcleş (Mehedinţi Hills), -25.7% at Polovragi (the Subcarpathian depressions), and -77.5% at Voineasa (the Intracarpathian area) (Table 3).

Lowest deviation in the mountain area (-23.8%) was registered at Parâng Station. The pluviometric time type (Hellmann Criterion), at the meteorological stations of Oltenia was droughty (D) at Craiova, Polovragi and Parâng and excessively droughty (ED) at Drobeta Turnu Severin, Bechet, Băcleş, Târgu Logreşti, Drăgăşani and Voineasa. The overall mean across Oltenia region was of 25.2 l/m² with a percentage deviation of -50.7%, which shows that December 2011 was an **excessively droughty** month throughout Oltenia, thus confirming the extension of the excessively droughty autumn of 2011 to the first month of winter all over southern Romania, as well.

Table 3

The monthly quantities of precipitation registered in the winter of 2011–2012 (ΣP), as compared to normal values (N) over the 1901–1990 period, deviation (Δ%) and pluviometric time type by the Hellmann Criterion (CH), (Hm=altitude of station)

Weather station	Hm	December 2011				January 2012				February 2012				Winter 2011–2012			
		ΣP	N	Δ%	CH	ΣP	N	Δ%	CH	ΣP	N	Δ%	CH	ΣP	N	Δ%	CH
Drobeta Turnu Severin	77	20.1	61.2	-67.2	ED	44.5	51.4	-13.4	LD	81.8	47.9	70.8	ER	146.4	160.5	-8.8	N
Calafat	66	24.8	45.5	-45.5	VD	64.2	40.4	58.9	ER	47.7	38.0	25.5	R	136.7	123.9	10.3	LR
Bechet	65	12.0	36.3	-66.9	ED	81.3	33.5	142.7	ER	29.9	34.8	-14.1	LD	123.2	104.6	17.8	LR
Băileşti	56	23.7	46.8	-49.4	VD	65.7	38.5	70.7	ER	47.0	36.1	30.2	VR	136.4	121.4	12.4	LR
Caracal	112	22.8	39.5	-42.3	VD	81.7	34.7	135.4	ER	35.2	34.5	2.0	N	139.7	108.7	28.5	VR
Craiova	190	29.7	41.8	-28.9	D	108.9	37.5	190.4	ER	48.1	30.4	58.2	ER	186.7	109.7	70.2	ER
Slatina	165	22.1	42.8	-48.4	VD	72.6	36.0	101.7	ER	52.9	38.4	37.8	VR	147.6	117.2	25.9	R
Băcleş	309	16.6	54.7	-69.7	ED	-	50.5	-	-	-	44.1	-	-	-	149.3	-	-
Târgu Logreşti	262	16.0	44.8	-64.3	ED	55.0	35.9	53.2	ER	70.0	41.0	70.7	ER	141.0	121.7	15.9	LR
Drăgăşani	280	20.9	44.6	-53.1	ED	58.0	34.1	70.1	ER	45.1	35.4	27.4	R	124.0	114.1	8.7	N
Apa Neagră	250	44.9	82.3	-45.4	VD	81.8	70.9	15.4	LR	106.2	66.4	59.9	ER	232.9	219.6	6.1	N
Târgu Jiu	210	25.5	64.0	-60.2	ED	58.3	53.9	8.2	N	81.0	52.0	55.8	ER	164.8	169.9	-3.0	N
Polovragi	546	41.7	56.1	-25.7	D	31.4	48.9	-35.8	VD	50.8	48.4	5.0	N	123.9	153.4	-19.2	D
Râmnicu Vâlcea	243	27.9	46.2	-39.6	VD	46.0	35.5	29.7	R	64.3	38.4	67.4	ER	138.2	120.1	15.1	LR
Voineasa	573	12.4	55.1	-77.5	ED	-	42.7	-	-	-	44.0	-	-	-	141.8	-	-
Parâng	1585	41.6	54.6	-23.8	D	88.8	57.7	53.9	ER	31.8	47.7	-33.3	VD	162.2	160.0	1.4	N
Mean for Oltenia	-	25.2	51.0	-50.7	ED	67.0	43.9	52.7	ER	56.6	42.3	33.6	VR	148.8	137.2	8.5	N

Source: Oltenia Regional Meteorological Centre, processed data.

3.3. Climatic aspects of December 1953

The winter of 1953–1954 was an unusually abnormal case compared to other winters, coming second to the cold winter of 1941–1942, when the lowest temperatures in Romania had been recorded (Bogdan 1969; Bogdan, Niculescu 1999; Bogdan and Marinică 2007).

From a synoptic point of view, this winter features an **extremely active atmosphere dynamics** which caused an abundance of snowfalls, snowstorm and snow accumulation (Diaconescu 1954, quoted by Bogdan 1999; Bogdan and Marinică 2007). The snow layer was gradually increasing from December to February, when it reached the apex, subsequently starting to decrease.

Therefore, in the last two decades of **December** 1953, the predominantly cold continental air was advected by the East-European Anticyclone, the influence of the Mediterranean perturbations, felt in the last decade, triggered few and scarce precipitation, therefore **the month was considered to be cool** (Table 4) **and very droughty**.

The warm period of December 1953 spanned the interval 1–6 December 1953, with a dominant atmospheric circulations from the western sector (W, NW, SW), and weather cooling on 7 December 1953, with circulations coming from the eastern sector (NE, E, SE). The warmest day was 1 December 1953, the coldest one 25 December 1953. The whole month was under an anticyclonic regime: 1–6 December, when the Azores High coupled with the North-African Anticyclone; after 7 December, there was the Central-European Cyclone with the Scandinavian Ridge, followed on 9 December by the East-European Anticyclone. Light snowfalls occurred on 17 December and 29–31 December 1953 through the coupling with a poorly developed Mediterranean Cyclone. After 1961, the minimum temperatures of December 1953 would be surpassed.

In December 1953, in the lower troposphere at the level of 850 hPa (about 1,500 m a.s.l.) there were 6 days with *warm advections* ($\geq 0^{\circ}\text{C}$), 8 days with *cold advections* ($-13.5^{\circ}\text{C} - -1.5^{\circ}\text{C}$), and 17 days with *close-to-normal temperatures* ($-6.5^{\circ}\text{C} - +5^{\circ}\text{C}$) (Table 5). Although the monthly maximum thermal values in December 1953 were higher than in December 2011, yet monthly means were lower than in the latter case, but *on the whole, December 1953 was colder than December 2011.*

Table 4

Extreme temperature values in December 1953 and registration date²

Locality	Tmin		Tmax		Locality	Tmin		Tmax	
	°C	Date	°C	Date		°C	Date	°C	Date
Cumpăna	-19.5	25	13.0	1	Ruşeţu			17.8	1
Voineasa	-19.7	25	14.2	1	Făurei			18.6	1
Olăneşti			17.3	1	Jurilovca			17.2	1
Polovragi			17.5	1	Valea Călugărească			18.6	1
Târgu Jiu			17.5	1	Măneşti			21.0	1
Târgu Logreşti			18.5	1	Pietroasa			20.0	1
Aninoasa			17.3	1	Buzău			19.7	1
Strehaia			18.4	1	Istriţa			20.0	1
Doiceşti			22.0	1	Adjud			18.6	1
Câmpina			20.5	1	Nicoreşti			17.3	1
Voineşti			19.5	1	Panciu			18.5	1
Bocşa Montană	-16.2	25			Târgovişte			21.0	1
Şviniţa			18.1	1	Pucioasa			21.6	1
Slăveşti			16.6	1	Curtea de Argeş			18.6	1
Găeşti			18.2	1	Moroeni			15.5	1
Nucet			17.7	1	Arefu			17.6	1
Piteşti			19.6	1	Câmpulung			17.2	1
					Omu Peak			8.2	1

Source: *Socialist Republic of Romania Climatological Atlas, 1966.*

In general, *the first snow-layer day* occurred 2–3 days later than *the first snowfall day*, and sometimes even on the same day, which means earlier in the east of the Romanian Plain (17 December) than in the West Plain (23 December), the delay being about one week. The cause was on the one hand, the presence of the Carpathian Curvature in the way of the air masses, deviating and delaying their simultaneous arrival on all the Plain, and, on the other hand, the milder (Submediterranean) climatic influences from the south and west of the Oltenia Plain. In Northern Bărăgan and the Lower Siret Plain, the North wind would scatter the snow, so that the first snow layer was formed around 23–24 December 1953.

² The date is assumed by the intensity of cooling at the level of 850 hPa, for all minimum temperatures registered in Tables 4, 7 and 10, Tmin=Minimum temperature, Tmax = Maximum temperature.

Table 5

Isotherms (°C) at 850 hPa above Romania, 00 UTC, in December 1953

Date	Isotherms	Date	Isotherms	Date	Isotherms	Date	Isotherms	Date	Isotherms
1	3.5...8.0	8	-3.0...3.0	15	-10.0...-1.5	22	-5.0...-1.5	29	-5.0...-3.0
2	0...6.5	9	-1.5...1.5	16	-10.0...-3.0	23	-6.5...-1.5	30	-3.0...1.5
3	1.5...6.5	10	-1.5...1.5	17	-10.0...-5.0	24	-10.0...-5.0	31	-3.0...3.0
4	5...6.5	11	-1.5...1.5	18	-10.0...-3.0	25	-13.5...-10.0		
5	5...6.5	12	-5.0...0.0	19	-10.0...-3.5	26	-10.0...-5.0		
6	3.5...5	13	-6.5...-1.5	20	-6.5...-1.5	27	-5.0...-3.5		
7	-1.5...5	14	-5.0...-1.5	21	-5.0...0.0	28	-5.0...-3.0		

Source: <http://www.wetterzentrale.de>.

3.4. The thermal regime of January 2012

The monthly thermal means ranged between -3.9°C at Voineasa and +0.8°C at Drobeta Turnu Severin and Calafat, with deviations from the monthly multiannual means of 0.0°C at Apa Neagră and 2.6°C at Calafat. The thermal time types (Hellmann Criterion) of January 2012 registered by weather stations were normal (N) in the hillsides and Subcarpathian depressions (Târgu Logrești, Apa Neagră, Târgu Jiu, and Polovragi) and warm (W) in the Oltenia Plain and the Mehedinți Hills (Calafat, Băilești, Caracal, and Băcleș). The overall monthly mean of the entire region was -1.6°C, with deviation from the normal mean of 1.2°C, therefore January 2012 was assumed to be a warmish (WS) month (Hellmann Criterion).

The monthly maximum air temperatures, registered in the first part of the month (2–4 January) and in its second decade (23 January), stood between 11.6°C at Drăgășani and Apa Neagră, and 16.1°C at Calafat, with a monthly maximum mean of 12.4°C throughout Oltenia (Table 6).

Table 6

The air thermal regime in January 2012: normal (N); mean (M); deviation from normal (ΔT), Hellmann Criterion (CH), air minimum temperature (Tmin), air maximum temperature (Tmax) and minimum temperature on soil (Tmin Soil) in Oltenia, January 2012 (Hm=altitude of station)

Weather station	Hm	N	M	ΔT	CH	Tmin		Tmax		Tmin Soil	
						°C	Date	°C	Date	°C	Date
Drobeta Turnu Severin	77	-1.1	0.8	1.9	WS	-16.6	31	14.2	3	-13.8	31
Calafat	66	-1.8	0.8	2.6	W	-19.2	31	16.1	3	-27.8	31
Bechet	65	-2.2	-0.5	1.7	WS	-24.4	31	15.1	23	-22.0	31
Băilești	56	-2.3	-0.3	2.0	W	-24.0	31	14.5	23	-28.2	31
Caracal	112	-2.9	-0.8	2.1	W	-23.0	31	12.7	23	-22.5	30
Craiova	190	-2.6	-0.9	1.7	WS	-20.4	31	12.8	23	-26.0	31
Slatina	165	-2.4	-1.2	1.2	WS	-19.7	31	11.9	23	-23.3	31
Băcleș	309	-3.0	-1.0	2.0	W	-17.7	31	12.4	3	–	–
Târgu Logrești	262	-2.7	-2.6	0.1	N	-23.9	31	12.5	4	-23.6	31
Drăgășani	280	-2.2	-0.8	1.4	WS	-16.8	31	11.6	23	-23.3	31
Apa Neagră	250	-2.6	-2.6	0.0	N	-24.6	31	11.6	4	-18.8	31
Târgu Jiu	210	-2.6	-1.7	0.9	N	-19.3	31	12.4	23	-21.6	31
Polovragi	546	-3.2	-2.5	0.7	N	-20.4	31	11.7	3	-26.2	31
Râmnicu Vâlcea	243	-2.2	-1.2	1.0	WS	-18.6	31	12.8	4	-18.3	31
Voineasa	573	-4.7	-3.9	0.8	N	-22.0	31	7.4	13	–	–
Parâng	1585	-5.9	-6.9	-1.0	CO	-16.6	31	8.2	2	–	–
Mean for Oltenia		-2.8	-1.6	1.2	WS	-20.5		12.4		-22.7	
Obârșia Lotrului	1348	-6.2	-7	-0.8	N	-27.3	31	5.6	3	–	–

Source: Oltenia Regional Meteorological Centre, processed data.

The monthly minimum air temperatures in Oltenia, registered on the last day of the month, were of -24.6°C at Apa Neagră in the Subcarpathian depression and -16.6°C at Drobeta Turnu Severin and Parâng, with a monthly minimum mean of -20.5°C . Minimum temperatures were caused by severe frost wave at the end of January and the first decade of February, and the cooling process that started on the night of 26/27 January 2012 (Table 3, Fig. 3), as revealed by the linear tendency of evolution of the three thermal parameters (daily minimum, mean and maximum).

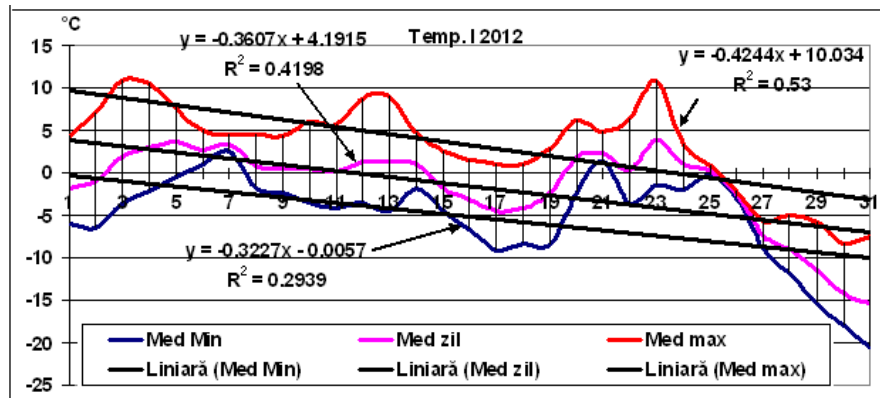


Fig. 2 – The variation of air temperature, daily means (Med zil), daily minimum (Med Min) and maximum temperature mean (Med Max), calculated for the entire region and the linear tendency of evolution, January 2012.

The monthly minimum temperature on soil surface: -27.8°C at Caracal and -18.3°C at Râmnicu Vâlcea, also registered on most of the territory on 31 January.

The monthly minimum temperature mean on soil surface was of -22.7°C throughout the region (Table 3). Analysing weather evolution in the lower troposphere at the level of 850 hPa (Table 3), it emerges that there were 2 days with warm advections ($\geq 0^{\circ}\text{C}$ on 2nd–3rd) and 11 days with cold advections ($-14...-5^{\circ}\text{C}$ on 15th–19th and $-16...-5^{\circ}\text{C}$ on 26th–31st), as well as 18 days with close-to-normal temperatures ($-8 - +5^{\circ}\text{C}$).

Table 7

Isotherms ($^{\circ}\text{C}$) at 850 hPa above Romania, 00 UTC, in January 2012

Date	Isotherms	Date	Isotherms	Date	Isotherms	Date	Isotherms	Date	Isotherms
1	-8...-4	8	-6...0	15	-10...-6	22	-8...-4	29	-10...-8
2	-6...+1	9	-6...-4	16	-12...-9	23	-5...0	30	-16...-8
3	+1...+6	10	-8...-5	17	-14...-12	24	-5...0	31	-15...-10
4	0...+5	11	-8...-6	18	-15...-10	25	-6...-2		
5	-3...+5	12	-6...-4	19	-12...-5	26	-10...-4		
6	-2...+2	13	-5...+1	20	-5...0	27	-12...-5		
7	-5...+2	14	-8...-5	21	-5...0	28	-8...-6		

Source: <http://www.wetterzentrale.de>.

Most of January 2012 was dominated by an anticyclonic regime characterised by *the presence of a high air pressure belt* (formed of the Azores High coupled with the North-African Anticyclone and the East-European Anticyclone, or only of the Azores High and the East-European Anticyclone), which at different periods of time:(24–28 and 30–31 January, 1–4, 5–8 and 13–14 February) acted coupled either with the Icelandic Depression, or more often with the Mediterranean Cyclones in generating snowfalls, sometimes very abundant and snowstorms, the heaviest snowstorm occurring on 25 January.

3.5. The pluviometric regime of January 2012

Monthly quantities of precipitation: 31.4 l/m² at Polovragi and 108.9 l/m² at Craiova in the central part of the region, with percentage deviations from the multiannual means of -35.8% at Polovragi and 190.4% at Craiova (Table 3). The pluviometric time type (Hellmann Criterion) at the meteorological stations of Oltenia was very droughty (VD) at Polovragi and exceedingly rainy (ER) in most of the region.

The precipitation mean for the whole region (67.0 l/m²), with percentage deviation of 52.7%, classifies January as an exceedingly rainy (ER) month.

Climatic risk phenomena were: fall of liquid precipitation (1–24 January), *mixed* falls (25 January), and *snowstorm-associated heavy snowfalls* (a yellow code warning of dangerous meteorological phenomena having been issued the previous day), *wind gusts* of 60–80 km/hr, especially in the south-east of the country and glazed-frost in the south of the Dobrogea Plateau and the Romanian Plain.

The heavy snowfalls deposited a consistent < 10 cm – thick snow layer in the east of the Bărăgan Plain and the north of the Dobrogea Plateau and of over 100 cm in the Southern Carpathians (Parâng 106 cm, Bâlea Lake 164 cm, Omu Peak 107 cm, etc.).

The local geographical conditions (altitude, landform, orientation towards wind direction, etc.), caused uneven snow accumulation, snowstorms, snowdrifts and piles that blocked the road traffic and buried in snow settlements, especially in the counties in the east of the Romanian Plain and in the Carpathian Curvature area.

3.6. Climatic aspects of January 1954

In *January 1954*, the same territory was also under the influence of high pressure anticyclonic formations from North-Eastern Europe, with advections of very cold air that, interfering with the Mediterranean depressions, caused abundant snowfalls and severe frosts, that month being qualified as very cold.

In the middle of the month, after two days (16th and 17th) of positive temperatures (+9...+10°C), the weather cooled again under the influence of the Scandinavian Anticyclone (22–28 January).

In the second part of January, Romania was under the influence of this anticyclone and also of a vast cyclonic Mediterranean area, located in the south of Italy, which moved slowly towards the east and north-east. Consequently, the wind blew very strongly from the east and north-east, the sky was overcast and there were snowfalls in most of the region, with severe cooling and snowstorms in the east.

In January 1954, *very low minimum thermal values* were being registered (*4 values* ≤ -30.0°C), some of them still not exceeded to this day.

We notice that *January 1954 monthly minimum and maximum thermal values are much lower than in January 2012*.

Analysing soil surface synoptic maps it emerged that the snowstorms of January 8, 10, 15 and 29–31 were the consequence of the coupling of the Mediterranean Cyclones with the anticyclonic belt formed between the Azores High and the East-European Anticyclone, or between the Azores High and the Scandinavian Anticyclone, that lasted the whole month. The ensuing snow layer persisted and became ever thicker that winter.

In the short intervals of close-to-normal temperature, the Azores High coupled with the North-African Anticyclone prevailed, the advection of a warmer air mass leading to a rise in temperature on 20 and 21 January (Table 8).

Table 8

Isotherms (°C) at 850 hPa above Romania, 00 UTC, in January 1954

Date-Isotherms	Date-Isotherms	Date-Isotherms	Date-Isotherms	Date-Isotherms
1 -5...0	8 -7.5...-3	15 -7.5...-1.5	22 -10...-5	29 -10...-3
2 -10...-5	9 -10...-7.5	16 -5...-1.5	23 -15.0...-7.5	30 -15.0...-5.0
3 -10...-7.5	10 -12.5...-7.5	17 -3...0	24 -20.0...-15.0	31 -10...-1.5
4 -12.5...-6	11 -12.5...-7.5	18 -5...0	25 -20.0...-17.5	
5 -10...-5	12 -15.0...-12.5	19 -10...-7.5	26 -20.0...-15.0	
6 -7.5...-5	13 -15.0...-10.0	20 -12.5...-5	27 -20.0...-15.0	
7 -7.5...-3	14 -15.0...-5.0	21 -5...0	28 -20.0...-12.5	

Source: <http://www.wetterzentrale.de>.

The weather evolution in January 1954, in the lower troposphere at the level of 850 hPa (about 1,500 m a.s.l.) was characterized by **22 days with cold and very cold advections** (-20 and -3°C) and 9 days with close – to – normal temperatures (-7°C – 0°C) (Table 8).

The whole month was very cold (VC) and extremely cold (EC) in the interval 22–31 January 1954, when the **frost wave lasted for 9 days** with a **peak of 6 days** (23–28 January), while in January 2012, lowest minimum temperatures (-25...-24°C) were registered only for one day at the end of the month (31 January).

3.7. The thermal regime of February 2012

The monthly average air temperature values were -6.6°C at Caracal (in the south-east of Oltenia) and -3.9°C at Râmnicu Vâlcea (in the Olt Corridor), with deviations from the multiannual means of -6.2°C at Bechet in the south of the region and -2.7°C at Voineasa. Thermal time-types (Hellmann Criterion), in Oltenia ranged between very cold (VC) in most of the Oltenia Plain in the Getic Plateau at Târgu Logrești and in the Subcarpathian Depression at Apa Neagră, and cold (CL) in the high hilly and mountainous area (Table 9).

The minimum air temperature values (-28.9°C at Băilești and -17.9°C at Drăgășani) were registered on 1 February, while the monthly minimum temperature mean of -23.1°C, was lower than in January.

The minimum temperatures at Calafat, Bechet, Băilești, Târgu Logrești, Apa Neagră and Obârșia Lotrului, marked with an asterisk in Table 9, represent **climatic records** for these stations, being the lowest values of the whole data series, not only because of frost waves, but also of radiative cooling caused by the cold air flows from the Carpathian-Balkan Mountains and the temperature inversions. The record low minimum temperatures in February registered in Bulgaria, a country situated south of the Danube, were also caused by these factors.

In February 2012 there were two frost waves. A first one from 31 January to 18 February, with certain temperature increases for a few days, basically **a lengthy interval of 19 consecutive days**. It was one of the longest frost wave episodes ever registered in Romania, with extremely low minimum values on **31 January, 1 and 9 February** (Table 9, Fig. 3). The second frost wave came at the end of February and lasted for 3 days: 27, 28, 29.

This was also confirmed by the analysis of the thermal field at the level of 850 hPa (Table 10). The configuration of this field shows the presence of **two cold and very cold advections** (-18 – 0°C), which generated 21 days of severest frost on 1 and 9–10 February 2012. Furthermore, there were 7 days with close-to-normal temperatures (-9 – +2°C) and a relatively warm day (0–5°C).

The official number of casualties left by the **severe lasting frost wave (31 January – 18 February)**, was of 86, on 10 February about 60,000 people were blocked by accumulations of frozen snow formed by wind drifted snow all over the country. Note: more than 600 casualties on the Continent until that date.

Table 9

The air thermal regime in February 2012: normal (N); mean (M); deviation from normal (ΔT), Hellmann Criterion (CH), air minimum temperature (Tmin), air maximum temperature (Tmax) and minimum temperature on soil (Tmin Soil) in Oltenia, January 2012 (Hm=altitude of station)

Weather station	Hm	N	M	ΔT	CH	Tmin		Tmax		Tmin Soil	
						°C	Date	°C	Date	°C	Date
Drobeta Turnu Severin	77	0.9	-3.9	-4.8	CL	-21.7	9	13.6	25	-23.4	9
Calafat	66	0.4	-5.2	-5.6	VC	-26.1*	9	12.6	25	-28.6	9
Bechet	65	-0.1	-6.3	-6.2	VC	-24.0*	1	11.8	25	-24.0	1
Băilești	56	-0.1	-5.9	-5.8	VC	-28.9*	1	9.6	25	-31.6	9
Caracal	112	-0.7	-6.6	-5.9	VC	-23.2	1	7.2	25	-23.2	2
Craiova	190	-0.4	-5.9	-5.5	VC	-22.6	9	8.9	25	-27.0	1
Slatina	165	-0.2	-6.0	-5.8	VC	-23.9	9	10.4	25	-25.7	2
Băcleș	309	-0.9	-5.9	-5.0	VC	-19.5	1	8.5	25	-	-
Târgu Logrești	262	-0.7	-5.9	-5.2	VC	-28.1*	9	12.6	25	-32.2	9
Drăgășani	280	-0.2	-4.6	-4.4	CL	-17.9	1	11.5	25	-24.0	1;2
Apa Neagră	250	-0.6	-6.0	-5.4	VC	-28.4*	9	12.4	24	-29.6	9
Târgu Jiu	210	-0.4	-4.7	-4.3	CL	-22.6	9	16.9	24	-29.4	9
Polovragi	546	-1.4	-5.0	-3.6	CL	-20.6	2	12.0	25	-26.7	9
Râmnicu Vâlcea	243	0.0	-3.9	-3.9	CL	-19.4	9	17.1	25	-23.0	9
Voineasa	573	-2.5	-5.2	-2.7	CL	-22.7	1	12.2	24	-	-
Parâng	1585	-5.6	-9.1	-3.5	CL	-21.7	2	5.6	23	-	-
Mean for Oltenia	-	-0.8	-5.6	-4.9	CL	-23.1		11.4		-	-
Obârșia Lotrului	1348	-5.5	-8.8	-3.3	CL	-28.6*	1	5.4	23	-	-

Source: Oltenia Regional Meteorological Centre, processed data.

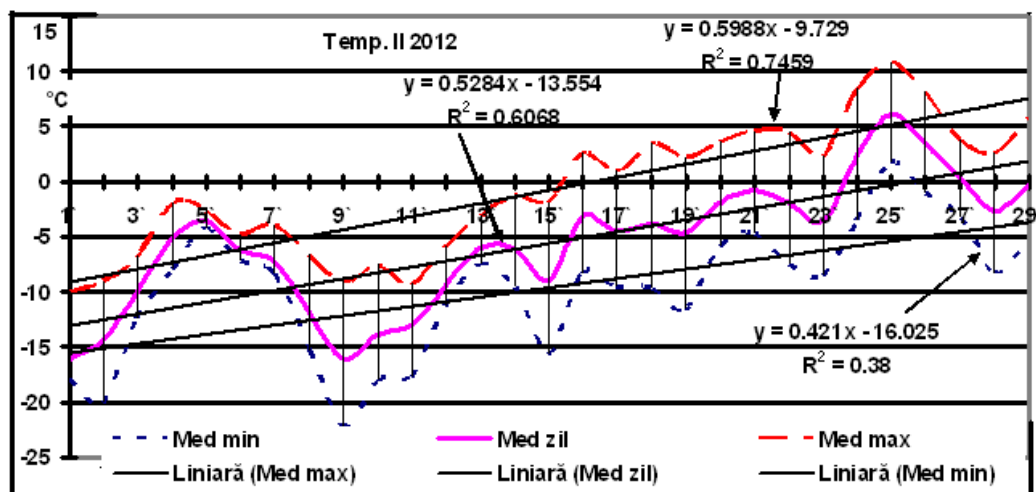


Fig. 3 – The variation of the air temperature, daily means, daily minimum and maximum temperature mean, calculated for the entire region in February 2012.

Source: Oltenia Regional Meteorological Centre, processed data.

The arrival of spring, associated with weather warming, was the result of some macro-processes at the level of the whole northern hemisphere and of Europe, being more obvious starting on 16 February, when daily maximum temperatures became positive (Fig. 3) and on 24 February, when daily thermal means became positive, too. There was a general trend of air temperature increase.

Table 10

Isotherms (°C) at 850 hPa above Romania, 00 UTC, in February 2012

Date Isotherms	Date Isotherms	Date Isotherms	Date Isotherms	Date Isotherms
1 -16...-10	8 -15...-5	15 -15...-8	22 -5...-1	29 -12...-4
2 -18...-12	9 -14...-12	16 -9...-6	23 -4...0	
3 -16...-10	10 -15...-14	17 -14...-8	24 -4...+2	
4 -10...0	11 -14...-12	18 -12...-5	25 0...+5	
5 -10...+1	12 -12...-8	19 -8...-4	26 -5...+2	
6 -10...0	13 -10...-4	20 -6...0	27 -10...-4	
7 -10...+1	14 -12...-4	21 -10...0	28 -12...-10	

Source: www.wetterzentrale.de.

Minimum temperatures on soil surface were extremely low (-23°C at Râmnicu Vâlcea and -32.2°C at Târgu Logrești (Table 9), which shows that severe cooling was not only in the air, on soil surface and at depth, but also on rivers and lakes, covering them with a thick ice layer. The severe frost registered at the end of February and the beginning of March blocked river traffic, damaged the ships caught in the ice and the installations of the Danube harbours.

3.8. The pluviometric regime of February 2012

The monthly quantities of precipitation in February (29.9 l/m² at Bechet and 106.2 l/m² at Apa Neagră), and their deviations from the multiannual means stood between -14.1% at Bechet (-33.3% at Parâng in the mountain area) and 70.8% at Drobeta Turnu Severin. Pluviometric time-types (Hellmann Criterion), looked as follows: little droughty (LD) at Bechet and exceedingly rainy (ER) at Drobeta Turnu Severin and Craiova, Târgu Logrești, Târgu Jiu, Polovragi and Râmnicu Vâlcea, and very droughty (VD) at Parâng in the mountains (Table 3).

The monthly precipitation mean for the entire region was of 56.6 l/m², with percentage deviation from the multiannual mean of 33.6%, which classifies February as a very rainy (VR) month throughout the region.

Apart from *the lasting frost wave*, another climate risk phenomenon was snowdrifting, which formed a thick snow pack (Fig. 4) not only in Oltenia, but also in the south of Moldavia, Dobrogea and Muntenia, with wind gusts of over 70–80 km/h, and visibility below 50 m in some snowstorm-affected areas. The storm buried in snow roads and railways, thus interrupting the traffic; in the Carpathian Curvature many villages, households and annexes were snow-covered. Highways, as well as cross-border roads in the south and south-east of the country were closed for almost 2 weeks, mainly because road traffic in the neighbouring countries was blocked.

The last snow fell between 11 and 15 February, associated with snowstorm on 14–15 February, deepest snow packs reaching 40 cm at Râmnicu Vâlcea and 135 cm at Balta (Mehedinți County). Oltenia was one of the areas with the deepest snow pack (Fig. 4).

Snow started melting on 16 February, when maximum positive temperatures were being registered, and lasted until 6 March. The process being slow, there was no flooding, so that on 4 March, a thin snow layer was seen only in the Subcarpathian area of Gorj County.

In this way, the soil water reserve could be remade, benefitting agriculture after an exceedingly droughty autumn.

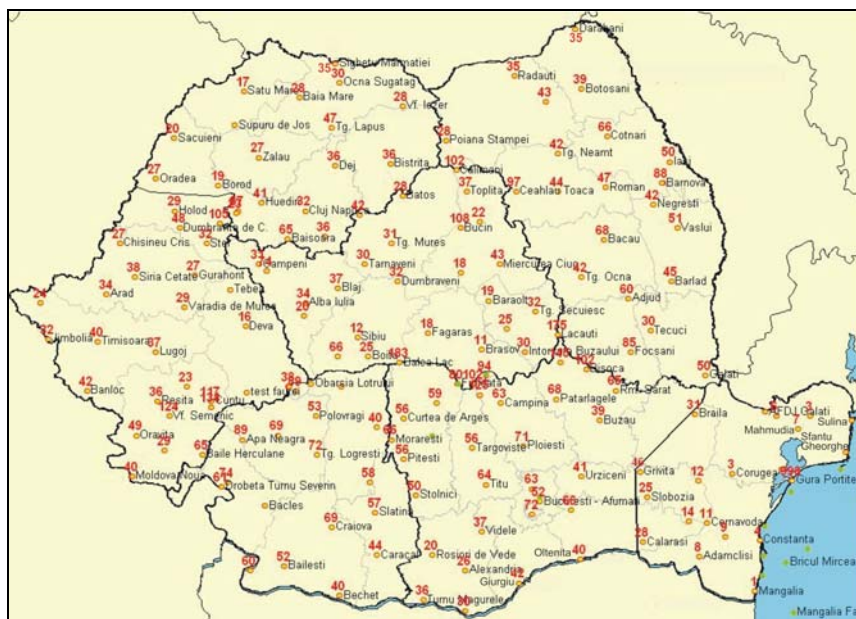


Fig. 4 – Maximum snow depth through accumulation (cm), was registered on 14 February 2012 at 08 o'clock (Source: National Meteorological Administration Bucharest).

3.9. Climatic aspects of February 1954

In February 1954, *minimum thermal values were very low*, some of them not yet exceeded (Table 11). Most of the monthly minimum values were registered on 5 February, others on 20–21 February, the majority between -26.0°C and $< -30.0^{\circ}\text{C}$.

In February 1954, in the lower troposphere, at the level of 850 hPa (about 1,500 m a.s.l.), *there were 17 days with cold and very cold advections* ($-17.5 - -2.5^{\circ}\text{C}$) and 11 days with close-to-normal temperatures for this month ($-7.5 - +2.5^{\circ}\text{C}$) (Table 12). The whole month was cold and extremely cold (1–11 and 18–23 February). The two severe frost waves lasted for 11 days with a peak on February 4–7, the second frost wave, of 6 days, reached a peak on 20–23 February. *The second frost wave is unusual for such a late period*, when the February air temperature is normally increasing.

Table 11

Minimum thermal values (Tmin) in February 1954 ($^{\circ}\text{C}$)

Locality	Tmin		Locality	Tmin		Locality	Tmin	
	$^{\circ}\text{C}$	Date		$^{\circ}\text{C}$	Date		$^{\circ}\text{C}$	Date
Slobozia	-25.4	5	Amara	-28.5	5	Cernavodă	-24.6	5
Perieți-Misleanu	-27.1	5	Grivița	-29.1	5	Hârșova	-23.6	5
Viziru	-27.5	5	Ion Sion	-28.0	5	Rușețu	-28.5	5
Videle	-29.0	5	Pârscov	-23.6	5	Măicănești	-26.4	5
Giurgiu	-30.2	5	Nucet	-30.5	5	Tulnici	-25.2	5
Pitești	-23.4	5	Snagov	-30.5	5	Pucioasa	-23.5	5
Voinești	-26.1	5	Roșiori de Vede	-29.0	5	Lehliu	-27.0	5
Budești	-27.4	5	Doicești	-23.5	5	București Băneasa	-26.2	5
Găești	-27.0	5	Râmnicu Vâlcea	-26.0	5	Slăvești	-31.2	5
Craiova	-27.6	5	Târgu Jiu	-28.3	5	Târgu Logrești	-28.6	5
Polovragi	-19.0	5	Iancu Jianu	-27.5	5	Voineasa	-25.8	5
Sălcioara	-28.5	5						

Source: Socialist Republic of Romania Climatologic Atlas, 1966.

In *February 1954*, atmospheric dynamics *reached a climax, out of the four snowstorm intervals* (2–4, 7–9, 17–19, and 21–22), the first was the most characteristic one.

Thus, *on 3 February*, a high pressure belt was formed above northern Europe through the juncture of the Azores High (extended over England) with the East-European Anticyclone (Fig. 5), further coupling with the Mediterranean Cyclones. At about 3,000 m altitude, there was an invasion of wet tropical air (+7...+8°C) over the arctic air, with temperatures of -15°C.

Table 12

Isotherms (°C) at 850 hPa above Romania, 00 UTC, February 1954

Date	Isotherms	Date	Isotherms	Date	Isotherms	Date	Isotherms
1	-12.5...-2.5	8	-10.0...-5.0	15	-2.5...0.0	22	-12.5...-5.0
2	-15.0...-2.5	9	-10.0...-5.0	16	-5.0...0.0	23	-15.0...-2.5
3	-12.5...-2.5	10	-10.0...-5.0	17	-7.5...0.0	24	-7.5...-5.0
4	-15.0...-12.5	11	-10.0...-5.0	18	-10.0...0.0	25	-7.5...-5.0
5	-17.5...-10.0	12	-5.0...-2.5	19	-17.5...-7.5	26	-7.5...-5.0
6	-15.0...-7.5	13	-5.0...-2.5	20	-17.5...-10.0	27	-5.0...-2.5
7	-15.0...-7.5	14	-2.5...0.0	21	-17.5...-10.0	28	-2.5...+2.5

Source: <http://www.wetterzentrale.de>.

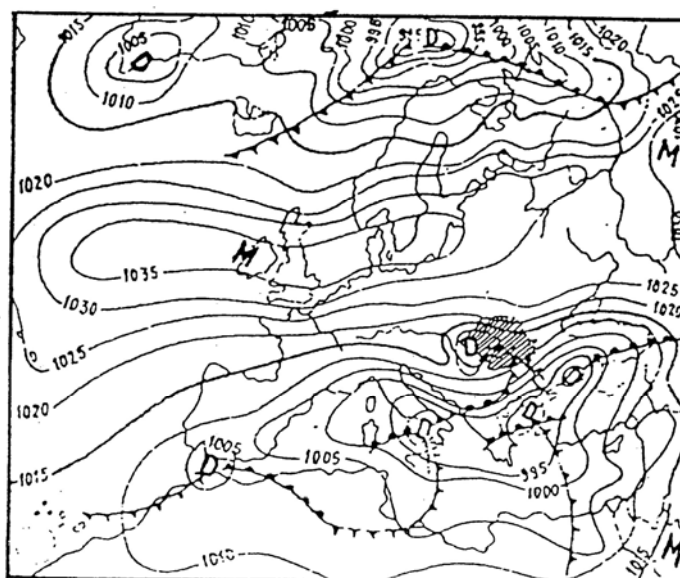


Fig. 5 – Distribution of pressure on soil surface, 00 UTC, 3 February 1954, (Source: Bogdan and Marinică 2007).

Consequently, there was *abundant snowfall, snowstorm*, and winds of 125 km/hour.

The same situation persisted on *4 February* when, after abundant snowfalls, a snow layer was formed in the Romanian Plain thick of 60–70 cm in the eastern sector and 70–80 cm in the western sector.

The dominant west and north-east wind, deviated by the Carpathian Curvature, intensified the snowstorm, scattering and piling up the snow. *This was the severest snowstorm in the Romanian Plain*, having occurred three times until the end of the month. At the end of the 4 snowstorm intervals, snow packs were 4–6 m deep; on the meteorological platforms, *the maximum depth of the snow layer accumulated after the falls, registered throughout the month, varied between 130 and 150 cm* (Fig. 6), with maximum depth at Călărași (170 cm) and Calafat (173 cm) (Bogdan 1969).

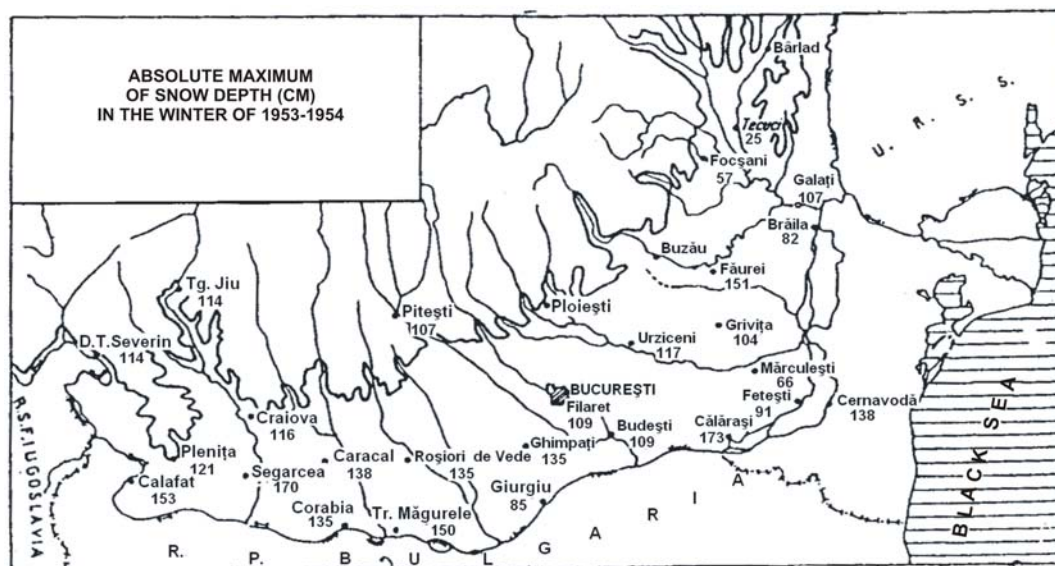


Fig. 6 – Absolute maximum of snow depth (cm) in the winter of 1953–1954.

Due to the extremely active dynamic of this winter, to the intensity of snowstorms, maximum snow layer, snowpack height, snow layer duration and the quantity of water yielded by it, February (the month of annual minimum pluviometric values, and of annual maximum pluviometric in 1954, at Grivița in the Bărăgan Plain (234.3 mm, compared to normal values of 20–30 mm), *the winter of 1953–1954 represents a 20th – century climatic record (still holding today) in terms of snow layer particularities, except for duration.*

Moreover, February 1954 was the *second frosty winter in the 20th century* (after January 1942), with minimum temperatures below -30.0°C , of which 20.0% represent absolute minima registered at the respective stations; there were 60 winter days ($T_{\text{max}} \leq 0^{\circ}\text{C}$), which is twice the normal, and 140–150 frosty days (about 1/3 over the normal), so the snow layer lasted, which was an exceptional situation of maximum snow-layer days (Bogdan 1969; Bogdan and Marinică 2007).

A synthesis of the characteristic features of the two winters (Table 13) suggests that the *winter of 1953–1954 was by far severer than the 2011–2012 one.* With few exceptions, it can be considered the severest winter in the whole country.

The very thick snow packs (4–6 m), favoured by the presence of the Carpathian Curvature, occurred at *the north-eastern outskirts of all localities in the south-east of Romania*, even Bucharest, the capital of Romania, was isolated and unable to supply its inhabitants with food; electricity was also missing because wires gave way under the weight of wet snow deposits turned into ice.

Many animals died suffocated. There were numerous cases when tunnels were dug in order to feed and water the cattle. Because of snow drifts, in which the north wind and the snowstorm played a significant role, *all traffic roads lying perpendicular to wind direction were buried in snow, especially in the south-east (Bărăgan Plain) and east (Moldavian Plateau) of Romania, including those around Bucharest, the capital-city.*

There was quite a “spectacle” along the roads lined with trees and wood plantations, actual snow fences holding back huge snow accumulations.

For example, along the Bucharest-Giurgiu highway, the tree line was all buried in snow. *The highway, kind of white way with snow dunes* and meandering paths at the level of telegraph wires, was used by workers on their way to and from Jilava rubber plant (south of Bucharest). Of all roads, most snowdrifts were on the *Bucharest – Lehliu – Fetești road and railway* (in the very heart of the Bărăgan

Plain), stretching out west-eastwards exactly perpendicular to the direction of the North wind. Consequently, many railway stations, cereal storehouses and trains were buried in snow and many houses in the north and north-east of localities were covered by the snowstorm (Bogdan 1980).

Table 13

Climatic indexes typical of the two severe winters: 1953–1954 and 2011–2012.

No.	Climatic indexes	Winter	
		1953–1954	2011–2012
1.	Maximum temperature	12.4°C...≤22.0°C	7.4°C...≤20.1°C
2.	Minimum temperature	-31.2°C...≤-19.0°C	-28.9°C...≤-6.0°C
3.	The total number of frosty days	39	32
4.	Snowstorm intervals in the same month	4 (II.1954)	3 (II.2012)
5.	The maximum number of snowstorm days in the same month	12 (II.1954)	7 (II.2012)
6.	Wind speed during snowstorms	125-140 km/hour	60-80 km/hour
7.	Thickness of drifts	3 – 6 m	2-3 m
8.	Maximum snow depths	173 (Călărași)	153 (Balta)
9.	The water amount resulting from precipitation during snowstorm maximum monthly episodes	234.3 mm/Grivița (II. 1954)	106.2 mm/Apa Neagră

All forest patches in the Bărăgan were also buried in the snow that reached up to the tree top. Animals would leave their shelters, rabbits would gnaw at the bark of tree-top branches, and wolves would roam around settlements.

Snowmelt left a distressing picture due to the mechanical effect of snow on the forest vegetation. The bridge of ice formed **on the Danube** could easily be crossed by tractor, thus linking the crossing-points of Ghecet and Brăila, Giurgeni and Vadu Oii, Cernavodă and Fetești.

Snowmelt might have triggered new risks (flooding) had there not been four droughty months before the winter (September excessively droughty, October and November droughty and December very droughty) which left the soil dry, reduced river and ground water levels, so that snowmelt water could seep into the ground. On the other hand, the moderate thermal regime of March favoured slow snow melting. In the third decade of March, when the dominant atmospheric circulation changed from east to west (with the western component prevailing), snow melting got momentum, so that the ice on the Danube and the other rivers did produce some local floods.

The moderate thermal regime made the snowmelt period in the mountains coincide with that in the plain, so that mountain waters did contribute to increasing downstream river discharge (Tiron 1954).

Due to slow snow melting and the big capacity of water absorption, the whole Romanian Plain benefitted from significant water reserves at the beginning of the vegetation period.

After snowfalls, there was intense weather cooling due to the extremely cold air advection from the north, north-east and east, local thermal inversion and intense nocturnal cooling, the clear sky and thick snow layer enhancing the cooling effect.

In the winter of 2011–2012, wind gusts of 60–80 km/hr buried in snow villages in the Curvature area (Buzău County). The wind-drifted snow covered the fields, and outskirts houses were actual defenses against the snowdrifts.

At Craiova (Oltenia) the snow layer was 68 cm thick, at Balta (Mehedinți) 153 cm (uneven snow layer), being the deepest in the south of the country. Yet, no house was covered in snow, only a few roads and the railway were blocked by snowpacks for a short period of time. Here, maximum snowstorm intensity **was reached between February 6 and 7 (2 o'clock p.m. and 6 o'clock p.m., respectively)**.

The only characteristic in common with winter 1953–1954 **was slow snowmelt**, allowing most water to seep into the ground and renew the soil and underground water reserve.

In conclusion, the winter of 1953–1954 was unusual, a specific case for the Romanian Plain and, with some exceptions, for the entire country.

*In winter 2011–2012, between 25 January and 15 February, an extremely severe winter episode occurred with snowstorm, lasting biting frost that made human casualties and material damages. The very intense climatic phenomena covered a territory extending from the Pacific Ocean (Japan), through Asia and Europe, to the Atlantic Ocean (Great Britain). The winter surprised people by the succession of events, and the fearful harsh weather phenomena led to some inadequate decisions, but also to actions of human solidarity, mutual assistance and donations (money, food, clothes, etc.). However, from many viewpoints (appearance / disappearance, duration, severe cooling, monthly snowstorm episodes, number of snowstorm days, abundance of snowfalls, thick snow layers, height of snowdrifts, maximum wind speed, consequences, damages, etc.), it did not surpass **winter 1953–1954**, which remains a major climatic hazard and a multiple climatic record not only for the 20th century, but also for the entire period since meteorological observation have been made in Romania.*

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THE TOURISM SYSTEM – MAIN DIRECTIONS IN EVALUATING ITS OPERATION

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Key-words: tourism, tourism science, functional structure.

The tourism system – primary directions in evaluating its operation. Tourism represents a complex system, with dynamic, geographic, temporal and unitary structure and functionality. It has various components of different influences according to the human interest determined by the social, economic, scientific and political conditions of the moment. Tourism implies special investigation and valuation on the crossing point of representatives from different fields of activities and diverse levels of the system hierarchically arranged. Tourism activities also imply quantitative and qualitative evaluations for the use of authorities, tourism operators, communities and tourists (influencing their decision-making process). Minute investigations, quantification and selection of tourism patrimony elements are essential in its valuation programs and regional socio-economic development programs. The paper deals with these considerations, providing a synthesis in tables and figures to analyse tourism activity.

1. INTRODUCTION

Tourism should be considered a complex system, fitted together and positioned in an area of interference of the essential components of the natural, social, and economic environments, whose development inherently led – theoretically – to the affirmation of a new interdisciplinary field of research which could be named the science of tourism), – and practically – to a variety of different activities which on the one hand engages part of the population as service providers, and also beneficiaries of tourism products, and on the other hand lead to the economic, social, spiritual development.

Tourism is, among other things, a system of distinct activities and studies (knowledge), whose complexity is strongly influenced by both the variety of its components, and the level of influence of those, against the human concern imposed by social, economic and political conditions of the moment. Hence, its distinction as an area of investigation and capitalization in the interweaving field of different branches of activity (scientific, economic, communicational and educational, political, etc.).

The expansion – both territorial and in time – of tourism activities, as well as their multiplication, led to diversification of the aspects (landings) of touristic domain (Fig. 1). Passing from local aspects of organization and limited deployment, for a small number of tourists to more comprehensive concerns involving interference of interests towards capitalization of touristic background, both from those who sought the economic side, as well as the beneficiaries of natural, spiritual, scientific properties, recreation, sports, etc. This led to the individualization of different directions within the system which, by multiplying the links between them, and also with external elements, imposed tourism as a distinct field, paternal, unitary, structured and with a separate organisation.

At first, we can separate these few steps having a functional destination more clearly ranked at international level (World Tourism Organization – WTO), at national level (ministries, departments, ANTREC, etc.) and regional (agencies, associations, travel clubs, etc.). Second is rendered more (on a

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local and national level) towards investigation, analysis, and quantitative and qualitative feedback, including the selection of touristic heritage items. Related to this expanded the design and realization of various facilities with a role in carrying out touristic activities and thus establishing a touristic heritage.

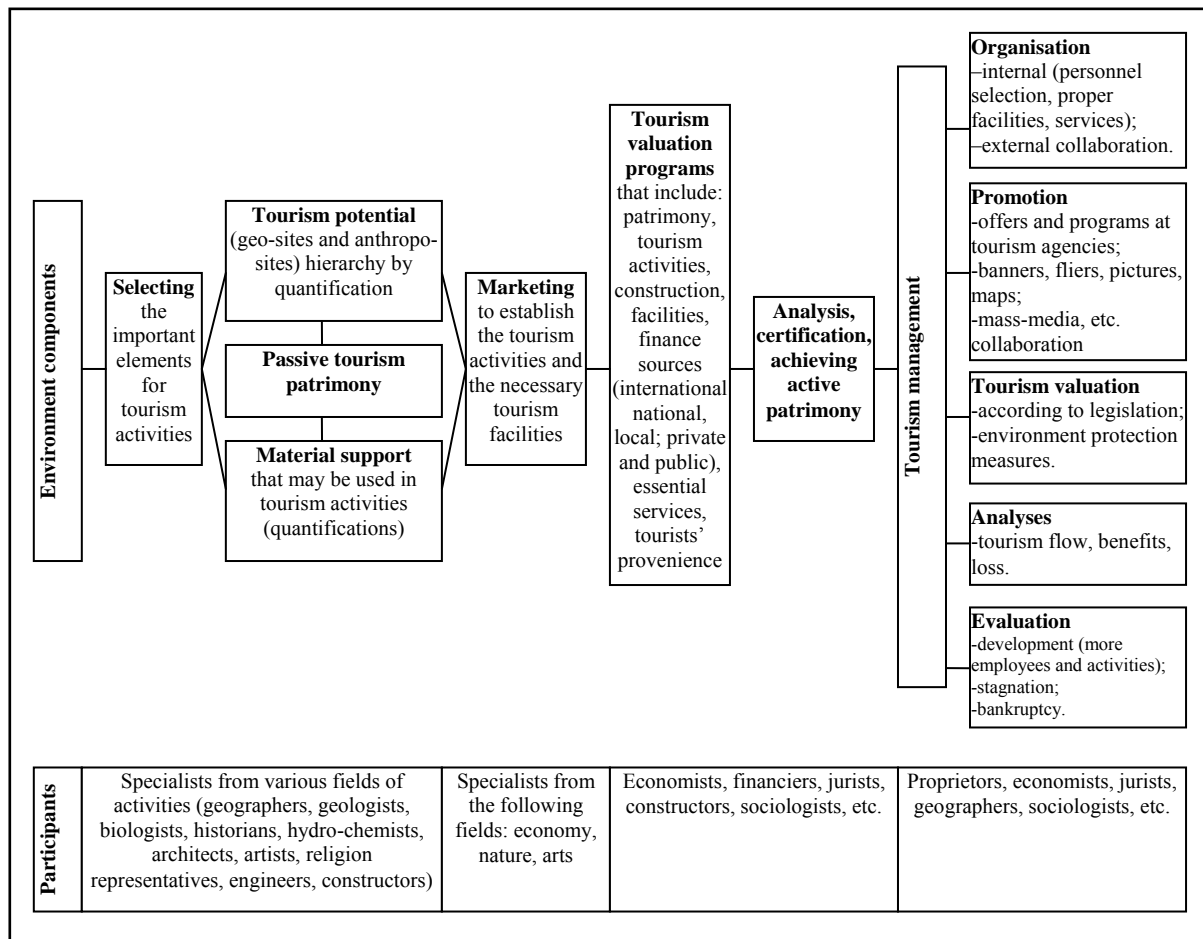


Fig. 1 – The sequence of activities and functional levels in tourism.

These are but a few guidelines providing a basis for the analysis of the role that research and capitalization of the touristic heritage has, imposing touristic field as the object of tourism science. They have the documentation to support both European and national level, but also a long theoretical and practical work in this direction.

2. A COMMON LANGUAGE IN TOURISM, AN IMPERATIVE

Theoretically is absolutely necessary to achieve a unified theoretical background leading to a proper understanding of intentions and ways to develop tourism heritage, and on the other hand to extend marketing and management tasks to achieve possible forecasts.

It has been created gradually a specific language of tourism activity, definitions with a mixed content, much influenced by the views of those who develop practical activities in various sectors of tourism. But as subsequent cooperation between them and debates in national and international level

meetings (organized under the WTO), the situation has been partially adjusted, especially in basic terms (remain differences in scope of understanding, in the use of parallel terms of close significance). In this respect, in our opinion, is necessary from the beginning the definitization of those terms with distinct role in understanding the composition and functional structure of tourism.

The basic components of touristic area fall directly into a hierarchical and functional unit, which is the subject of a **tourism** science.

The concept of **tourist** has been considered since the 19th century, but also today, as a participant in types of activity, leisure, rest, knowledge and even some forms of hazard. It gradually extended its sphere of understanding and use to many other concerns required by various reasons, but also the ways in which it is practiced, some of them stimulative (adventure, extreme sports, business, etc.), restrictive (constrained to a duration exceeding one day or a space outside the residential area; service performance leading to monetary gain, etc.) or inappropriate (strictly professional, political, electoral travels, erotic exotism, begging, etc.). The real meaning – in line with current requirements – should be reported to at least three requirement, as follows:

- *a distinct movement motivation* (tracking, relaxation, rest, adventure, knowledge, etc.);
- *leisure in spare time* (outside work hours) from a few hours (one hour tour and visit to a museum, etc.) to several weeks;
- *travelling outside professional concerns*.

Tourism, regardless of the option as sense related to basic training, is a broad term that refers to a complex but unitary system, in which the components are inter-related in variable proportions, and the analysis of which (in the last decades by quantization) leads to the establishment (through a primary marketing) of both the level of knowledge and exploitation for tourism (a region, zone, axis, center, etc.), as well as shaping of an evolving direction which is profitable for both visitors and servicing personnel, and to ensure economic and social development of the region. In the accomplishment of these goals the support and the ideas of projects related to all specialists trained in different directions must be unanimous.

3. TOURISM – FUNCTIONAL STRUCTURE

Tourism has to be integrated within the unitary system of the economy. From the macroeconomic point of view, tourism organisation implies a proper framework, a sequence and connection of tourism components that ensure its optimal functioning. Statistics proves the economic importance of this sector in using labour, or in export and import. The increasing need of capital makes governments to involve more in supporting tourism.

Systematic and permanent information on demand and offer of tourism (national, regional, local) destinations are essential in making an efficient tourism policy. Legislative, organisational and administrative measures represent the institutional support of tourism activities. Tourism organisations and authorities may be public or private, commercial companies or professional associations with international, national or regional (local) activities.

Tourism organisation system is made up of three hierarchical levels: central (coordinator) authority, regional (local) authorities and sectorial organisations (Minciu 2000). The central authority may be the national administration and is often correlated with the international authorities and their structures. Its main attributions are: to coordinate tourism activities nationally; to prepare the strategy of tourism development; to promote tourism internationally and domestically; to initiate and promote rules and specific regulations; to be a representative within international tourism organisations. The regional organisations prepare and coordinate the tourism strategy on local level, cooperate with municipalities, and carry out marketing actions in tourism by providing information and lodging services and a wide range of promotional activities. The regional organisations usually have functional

autonomy and own budgets, and may be non-governmental organisations (for example ANTREC, Asociația Mărginimii) and foundations. The sectorial organisations represent the elementary cells of tourism system: commercial companies or professional associations, direct producers of holidays and tourism service providers.

Within this analysing, conceiving and forecasting system, geographers have precise tasks in many chapters of the projects, but especially in investigating and quantifying the tourism patrimony, evaluating the human resources as providers and beneficiaries of tourism acts, studying and forecasting tourism flows, specifying the types of tourism activities that can be done according to the regional patrimony, directing to certain prior offers, etc (Table 1).

Such system would provide noticeable results as: hierarchical appreciations of tourism patrimony' components; a realistic direction in establishing the tourism activities of immediate efficiency or future valuation; the type and volume of tourism facilities included in plans of tourism development; market research and management forms.

In order to achieve these goals, some methodological and methodical requirements are mandatory:

- to account (quantified selection) and sequence by value and by tourism activity the natural (geo-sites) and anthropic tourism potential (anthropo-sites), as well as the existing tourism facilities, in order to establish the passive (starting) tourism potential and direct it toward certain profitable tourism activities;

- research (preliminary marketing) in order to appreciate the viability of prospective tourism products for the existing facilities, as well as the future facilities and their necessary financial and human resources;

- a management system proper to the achieved (active) tourism patrimony, according to tourism activities, demands and services (it refers to organisation, leadership and cooperation with product suppliers, transporters, and promoters);

- to know the stimulative and restrictive factors of tourism flow in order to improve the ability to interfere effectively;

- ensuring environment and patrimony protection for the present or future tourism valuation of the respective territory;

- humans should be regarded not only as consumers of tourism products, but also as developers of tourism objectives and structures, tourism managers, main factors in increasing local and regional revenues, or in exchanging cultural experience.

Table 1

Tourism – functional structure

MAIN COMPONENTS	SECONDARY COMPONENTS OF DIFFERENT CATEGORIES		
I. Tourism patrimony (real touristic offer)	Tourism potential (potential touristic offer)	Natural tourism potential (geo-sites)	geomorpho-sites, hydro-sites, eco-sites, etc.
		Anthropic tourism potential (anthropo-sites)	cultural-historical, sportive, recreational, technical and economic, social
		Social and demographic tourism potential	population and tourism labour, human (urban, rural) settlements
	Tourism technical and material support (tourism facilities)	Basic tourism facilities	accommodation units, food and beverage units, means of transportation (including lift transport)
		Auxiliary tourism facilities	amusements and treatment structures, recreational activities (cultural, artistic, sportive)
		Supplementary tourism facilities	diverse rental units (car, sportive gear), photography services, souvenir stores, tourism information units

	General infrastructure (technical and material support)	Means or transportation and communication (accessibility)	road, air, rail, naval, public transport, telecommunication	
		Technical and urban network	water and gas pipes, sewerage systems, electric energy cables, ecologic waste systems	
		Commercial units and service providers	diverse commercial units, medical and pharmaceutical services, postal services, bank services, etc.	
2. Resources to use the tourism patrimony	Financial	Budget	European, national, county programs, etc.	
		Private	private programs	
	Economic	Budget	European, national, county programs, etc.	
		Private	private investors	
	Human	Full-time employees	specialized, unqualified	
		Part-time employees	specialized, unqualified	
3. Types of activities according to different criteria	Environments	Regional	local, national, international tours	
		Anthropic	urban	
			rural (agritourism, rural tourism)	
		With human interventions	mountain	
			aqua-tourism	
			seashore	
			parks with facilities for tourism	
		Natural	mountain	
			natural preserves	
			national parks	
		Duration	A few hours	to one or two tourist sites
			A day	local, regional tours
	More days, weeks		tours	
	Motivation	Cultural-artistic	architectonic	
			artistic	
			ethno-folkloric	
			religious (pilgrimage, church dedication day, etc.)	
		Historical		
		Voyage	curative: spa cure, climatic	
			recreation, rest (camps, weekend, hiking)	
		Leisure (recreation)	seasonally (wintertime, summertime), occasionally or recurrent events (festivals, fairs, anniversaries, scientific events etc.)	
			adventure	
			sports	
			hunting	
			fishing	
			horse riding	
			business	
			recreation	
		Training, creation	training	
	research			
	lucrative assistance			
	Education	hobby		
ecotourism etc.				
Economic	visiting industrial, agricultural tourist spots, constructions, traditional equipments			

	Number of participants	Individual		
		Familial		
		Groups	heterogeneous by age and education	
	Others	Tourists, travellers, political activities, etc.		
	Means of transportation	Hiking	trips	
		Auto touring	trips, weekend holidays, tours	
		Bicycling, motorcycling, auto touring, etc.	trips, weekend holidays, tours	
		Cruising trips (with different types of boats, used permanently or by groups)	cruises, navigating through gorges and bays, etc.	
		Air-voyages (by plane, helicopter, balloon, paraglide, etc.)	transfers, tours, adventure	
	Organisation	Individual	trips, hiking, etc.	
Tour operators, different organizations or associations		trips, tours, cruising trips		
Destination rank	Local	trips, hiking, etc.		
	National	trips, tours, etc.		
	International	tours, cruising trips, etc.		
4. Tourism management	Tourism organisation Management, evaluation in unitary systems Programs on different levels (international, national, county, agencies) with opportune partners	Central (coordinator) authority	national tourism authorities with different administration forms: tourism ministry, direction or secretariat within a ministry, public department, governmental office, committee	
		Regional or local authority	non-governmental organisations, associations, foundations	
		Sectorial organisations	commercial companies or professional associations – holiday producers and tourism service providers	
5. Tourism flow analysis	Yearly, seasonally, different periods	Locally, regionally, nationally By activity type By age or profession		
6. Economic benefits	For the participants to different tourism activities	Individually Homogeneous groups (students, adults, retirees, etc.) Heterogeneous groups (specific activity)		
	For tourism service providers	Companies and employees in different structures focused on various tourism activities		
7. Evaluation and forecast	Diverse final analyses	Marketing environment analysis: market, competitors, product and service portfolio, market shares, SWOT analysis Marketing objectives Marketing strategies (of market, product, price, promotion) and the marketing budget Marketing programs (promotion, distribution) Evaluation and control	Favourable elements for tourism activities Restrictive elements for tourism activities Sustainable development in local, regional, national territories Environment and human creation protection and conservation Tourism characteristics sequenced by value from a certain region, city or axis Stakeholders' responsibilities toward tourism	

Though specialists from various fields of activities contribute differently, they agree with the tourism importance on local and regional development and consequently their language and thinking is unitary. There are different programs in content and size:

– *projects of local tourism valuation*, generated by certain characteristics of the natural, historical, artistic, architectonic, religious components, proper for education, information and knowledge tourism activities, leisure, adventure, hobby, photo-safari, etc.; these are villages or cities, mountain areas, sea shores, white waters, steep slopes, caves, etc.;

– *projects for facilities located near large cities*, climatic resorts, spas, or on areas of convergent transport routes; they generate important tourism flows and resources for tourism activities (amusement parks, aquatic complex, ski resorts, commercial or recreational facilities, etc.);

– *projects of complex tourism development for large regional areas* in which the social and economic requirements are correlated with the natural potential and the protection of environment equilibrium, human protection and community rights, so that an efficient and sustainable development may be achieved.

4. CONCLUSIONS

Therefore tourism should be regarded as a field with complex dynamic, geographic, temporal and unitary structure and functionality, and not reduced to a simple economic sector (“tourism industry”) producing revenue. This characteristic may be confirmed if each component of the system is given a proper significance and the connections between them are identified properly. Hence the system as a whole functions appropriately and each category of participants in the tourism process finds its rightful place.

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EVOLUTION OF SPATIAL COMPLEXITY IN ROMANIA: NETWORKING, DIFFERENTIATION

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Key-words: spatial complexity, disparities, Romania.

Evolution of spatial complexity in Romania: networking, differentiation. The spatial complexity is negatively correlated with regional specialization. Demonstration of how regional specialization has been evolving has relevance in studying the dynamics of spatial complexity. The organization of phenomena has been studied starting with O. Onicescu's research of entropy measurement using Information Energy Index based on the sum of squared frequency of components. Entering this index data indicating the share of employment in key sectors of the economy we noticed that an important feature of complex systems is their tendency to increase their own complexity. It has been observed that processes of complex systems tend to develop complexity. Thus, complexity in nature is increasing. Many researchers are convinced that self-powering increasing complexity is an obvious fact, not without consequences - mainly because it sometimes leads to imbalances in the development of various system components that will not go unnoticed in the dynamics of the system as a whole.

1. INTRODUCTION

The space complicates once the notion of distribution is injected, said Thrift (1999). Spatial distribution, in itself, began to be taken into account to explain much of what happens in the world: from the beginning, the geographical world is one of disorder and inconsistency. O'Sullivan's remark (2004) on the low role assigned to geography by the first theorists of complexity science is fully justified. His argument is that geographical space over time configured and reconfigured the systems. Continuing the idea, one can bring evidence to show that geography is the determinant and support of the systems' evolution. The same dissatisfaction is fueled by how economists approach to the new economic geography (Krugman 1991a, 1991b, 1994, 1999; Arthur 1988; Berry 1994; Dymski 1996; Fujita *et al.* 2000; Isserman 1996; Martin 1999; Storper 1997), the issue of space being seen as a fixed frame for structuring interactions between economic entities, as opposed to geographers who, inspired by complexity theory ideas, lays interactions in a broader social, economic and political frame (O'Sullivan 2004).

The same intuition concerning the role to be played by geography has also Thrift (1999) who noted a core theory in complexity science theory which is spatially quite natural: it can be argued that complexity theory is about spatial ordering that arises from energy injection. Since previous scientific theory core were primarily interested in the temporal progression, complexity theory is equally interested in space. The overall structure depends on the emerging properties arising over time out of spatial order. First of all, the core theory questions about the instability, crisis, difference, disaster and impasses (Stengers 1997) in a way that suggests there is a clear affinity between "natural" and "human" sciences, a constant dream of geography. But geographers, continue Thrift (1999), have not utilized this opportunity a relatively long period of time, remaining on the field, mainly for reasons depending on conjecture.

The evolution far from equilibrium of complex systems derives from the second law of thermodynamics, discovered in mid-nineteenth century, which states that heat flows move from high to low temperatures, a kind of steam engine. This proves that the energy distribution is far from being

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in equilibrium and that the thermodynamic force acting spontaneously and minimizing potential or maximizing entropy, makes time to be considered irreversible. Entropy clarifies the order and disorder occurring in complex systems evolution due to the “uncertainty information“ (Shannon, Weaver 1949).

2. MATERIALS AND METHODS

Complexity theorists Prigogine and Stengers (1984), Rössler (1986) and Casti (1994) Gell-Mann (1995), believe that understanding, knowledge interiorization using a mental model of the system depends on each observer, on whether he/she has a privileged relationship with the object observed, complexity is not an intrinsic property of an independent reality but is, at least partially, a feature of knowledge, a feature attributed by the observer.

To bring objectivity to our research, we used here a data set on employment in the main sectors of the economy at regional level NUTS III, spatial complexity being negatively correlated with regional specialization. Demonstrating how regional specialization evolving has relevance in studying the dynamics of spatial complexity.

The degree of organization of these phenomena has been studied by Octav Onicescu (1966), who changed Shannon’s index (Shannon, Weaver 1949) for the measurement of entropy into Information Energy Index which can be summarized as the sum of the squared frequency of components.

In the Information Energy Index (IEI) formula by Onicescu we entered data on sectoral employment for two reference years: 1997 and 2002.

$$IEI = \sum_{i=1}^n I_i^2$$

where

$I_i, i=1, 2, \dots, n$ represent the proportion of active population occupied in each main activity sector.

3. RESULTS AND DISCUSSION

The Information Energy Index was mapped for the analysis of spatial distribution in the years 1997 and 2002 and the evolutions recorded during the interval mentioned above.

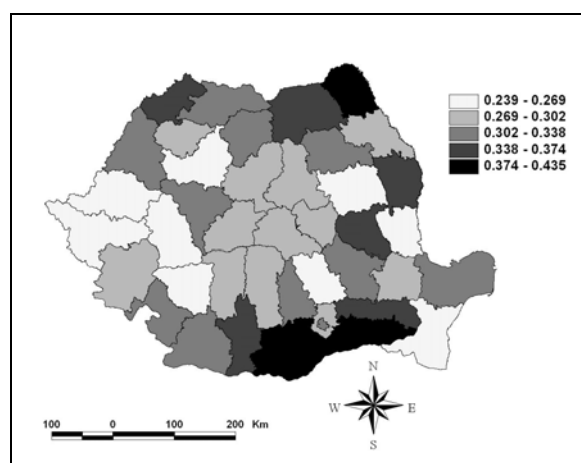


Fig. 1 – Information Energy Index, 1997.

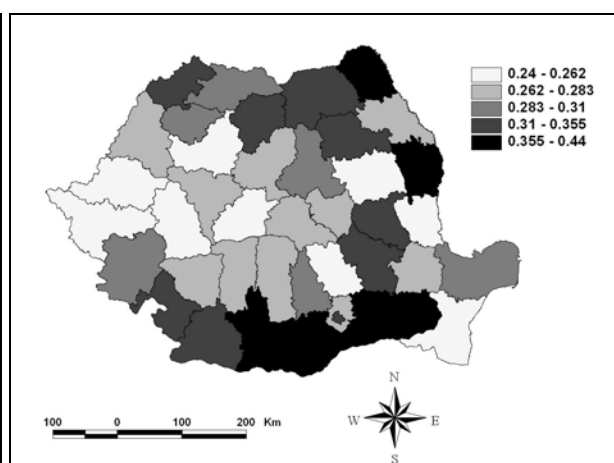


Fig. 2 – Information Energy Index, 2002.

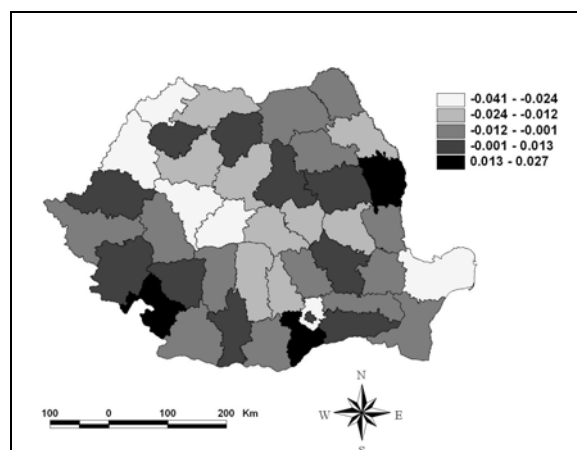


Fig. 3 – Evolution of Information Energy Index, 1997–2002.

High values of the Information Energy Index are translated into reduced spatial complexity due to the large share of employment in one of the branches of the economy and hence the concentration of economic activities in that branch. The highest values of the Information Energy Index were gathered in the south and northeast of the country where the share of employment in agriculture and industry is about 60% and 15%, respectively while low values are specific to counties in the western part of Romania, where the share of the population employed in agriculture and industry is about 30% and 25–35%, respectively.

The positive trends in the Information Energy Index from the 1997–2002 period meant a specialization of economic activities, namely the reduction of employment in some economic activities and its redistribution to other dominant economic activities. For example, in the Vaslui, Giurgiu, and Mehedinți counties, which were characterized by augmented Information Energy Index, increased the share of the dominant economic branch - agriculture or the next branch in importance – the services sector. Decreases were recorded in the share of employment in the industry and construction sectors. In two-thirds of the counties of Romania, the evolution of the Information Energy Index was negative, leading to a diversification of economic activities by increasing employment in activities such as trade and other services and decreasing the share of employment in agriculture and industry – the dominant economic activities.

These changes are aimed primarily at the rural space. As noted by Rusu (2009), the rural space is more complex than we used to think, considering it to be dominated by agriculture. Actually, countryside dynamics is entailed, also, in the evolution of other economic functions. According to Rusu (2009), in the transition period the main source of partial failure that had some rural areas - the illusion of mono-functionality and transition strategies focused solely on agriculture.

Rural economies based on non-agricultural activities are the sign of a counter-urbanization phenomenon. Its causes are in the links between center and periphery. The relationship between the urban center and its area of influence depends primarily on urbanization level and economic development, generally (Popescu 2011). On the other hand, when we analyze the relations between the rural and the urban areas one must start from economic specialization, which is the main source of stimulation for these relations through the complementarities and functional dependencies they create (Popescu 2011).

Fixed links between urban and rural areas are due to lack of forces of the city required to bring important changes, urban influence being visible in a limited space. This occurs in the case of small and medium towns in Romania, leaving room for unpolarized areas among which are disadvantaged areas. The city provides a range of services for the rural area (commercial, educational, medical, cultural) and jobs (Stoica *et al.* 2011).

As Tacoli (1998) pointed out (quoted in Stoica *et al.* 2011) spatial development policies that have attempted to integrate rural and urban dimensions have often failed because they were based on incorrect generalizations of relations between the two.

One of the reasons for not accepting the period of collectivization in the communist era and, at the same time, eulogy of the decollectivization process that followed the 1989 revolution is the theory of “reversible history” which claims that spatial, economic and social structures affected by communism must return to the pre-war positions (Rusu 2009). Béatrice von Hirschhausen (1997) is one of the supporters of this theory, saying: “More than in neighboring countries, Romanian decollectivization was interpreted as a return, validating the belief in the reversibility of history and making collectivization episode appear as aberrant phase that can be removed from history” (quoted in Rusu 2009). We believe that the evolution of the socio-economic system is dependent on initial conditions and this is one of the examples when deviations occur in a particular evolution trend which is corrected by means of the self-organizing system that learns and adapts.

Complex spatial socio-economic systems are in a continuous transformation, the effects of many small independent shocks in different sectors of the economy are not canceled as a whole, due to lack of the kind of shock linear aggregation needed for the law of large numbers application. Conventional reasoning fails as a result of strong localized significant nonlinear interactions between different parts of the economy argue Bak, Chen, Scheinkman & Woodford (1993). The type of macroscopic instability that may result has been studied in various contexts earlier as “self-organizing criticality”.

The self-organizing internal structure determines the response of the socio-economic component interacting with the environment and the fact that the internal organization is robust to external changes (requiring a certain intensity of external stimuli to change the internal structure) gives a different response from that of linear determinism as said Șerban, Ianoș 2012.

Creating a mental system of reality on which to expand the economic potential of a territory through positive feedback loops that feeds complexity dynamics is what is intended by decision-makers either at political or economic level. But things are not so. The increasing spatial complexity has also negative effects that are related to the state of environment that is heavily transformed by human pressure. The woods are converted into crop land or agricultural land are being used for industrial or residential construction. The primary state of the environment, the resources that it entails have been equated with the term eco-energy (Ianoș *et al.* 2011).

The divergence between the stock of eco-energy and the degree of connectivity

As pointed by Ianoș (2000) and then by Braghină *et al.* (2010), the largest primary eco-energies are located in heavily wooded areas where human activity is present only at the periphery, very punctual or along the axis of penetration, while the lowest amount of eco-energy is in the highly urbanized areas, those with intensive surface mining or natural areas that were completely degraded by vegetation clearing and soil removal.

Reduction of eco-energies in big cities determines their search by the population in rural areas, thus taking place an eco-energy transfer from rural to urban areas. The regularity with which the movement of urban populations is conducted to the rural areas determines the “transfer of development” and thus rural destination change. This transformation is sometimes so radical that some environmental component representing attractiveness diminishes the quality. Through eco-energy consumption there is an increase of spatial complexity by anthropogenic subsystems diversification (Ianoș *et al.* 2011), in this case the components of the rural anthropogenic system. The rate at which the eco-energy consumption happens, makes their regeneration impossible, slowing down the increase or even the inversion of spatial dynamics, where imbalances between the components of the environment are irreversible.

If during the development period conservation is not taken into account, as much as possible, the environmental elements (by harmonious integration of architecture into the environment, etc.) namely eco-energy, the decline will come soon and will be irreversible.

4. CONCLUSIONS

Economic evolution is linked to differences in the geographical space, both in terms of natural resources and their exploitation. The spatial complexity study takes into account the analysis of economic activities in terms of their diversity, to ensure several development paths making economic evolution less vulnerable to internal fluctuations and especially to external shocks that occur with a certain periodicity.

The initial preference for location of economic activities in a specific area, against other areas, forming and developing human agglomerations, areas of economic activity and a high population density, through a process of circular causality. This creates a human settlement system in which privileged locations more than others grow into cities having around a polarization area consisting of villages and towns. These interdependences created between different locations explains how the economic situation of a region has consequences not only on locations within it but also on other near and far regions.

Finally, we would like to note the misuse of the term development in place of evolution, the two are not equivalent. Path dependence, explaining cumulative economic evolution had strong influences on evolutionary economics using concepts of complexity theory. Inspired by evolutionary biology, evolutionary economics deals with economic systems as evolutionary systems. What is new in evolutionary economics is, according to Witt (2008) not taking choice or decision object features as settled. Also, the analysis of non-equilibrium processes (transforming the economy from the inside) and its implications is a bold approach to classical economics of equilibrium. Processes, in turn, arise from the actions of different agents with limited rationality that can learn from experience and interactions and whose differences contribute to change. The subject is based on Charles Darwin's evolutionary method and the principle of non-equilibrium economy of circular and cumulative causation. In this sense it is natural to consider the economy as a "evolving" and not "developing" process, the latter referring rather to bringing something to a fixed state, instead of a process that can go anywhere.

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LE TERRITOIRE, UN CONTENEUR DE SPECIFICITES LOCALES: MIS EN EVIDENCE PAR L'ANALYSE DU SYSTEME PRODUCTIF LOCAL DE KSAR-HELLAL (TUNISIE)

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Mots-clés: système productif local, territoire, ressources spécifiques, industrie de textile-habillement, Ksar-Hellal (Tunisie).

The territory, a container of local specificities: evidence by analysis of the local productive system of Ksar-Hellal (Tunisia). *The article aims to highlight the relevance of the territory in the experiences of local development. Indeed, by an application on a Tunisian case, it was shown that the territory of Ksar-Hilal is embedded in the functioning of its local production system, specializing in textile and clothing. It turned out that the hilalian territory is overflowing of specific resources, whether of economic process as competition, complementarity or non-economic processes, such as, cooperation, technological externalities, shared values and local regulations. Those resources that are specific to hilalian territory are essential to stimulate the local dynamics of the productive system in question.*

Classification JEL: O14, O18, R19.

INTRODUCTION

A partir des travaux pionniers des italiens sur les districts industriels (Bagnasco 1977; Garofoli 1981; Becattini 1989), une nouvelle conception de l'espace est adoptée, émanant un renouvellement assez sensible de l'économie de développement. Les auteurs montrent comment la prise en compte du territoire permet d'engager une réflexion sur les expériences locales de développement, y compris celles qui s'épanouissent dans de nombreux Pays En Développement (PED). L'espace n'est plus seulement une distance entre différents lieux, un obstacle pour l'échange de marchandises ou, un coût pour les agents économiques, mais il est aussi une accumulation de relations sociales, où se sont insérées la culture, et autres spécificités locales, qui ne peuvent pas être transférées (Becattini 2000). Le territoire, devient en effet, un élément central du développement, que les théoriciens appellent, le *développement endogène*. Il s'agit d'un phénomène alternatif au modèle de croissance fordien, reposant sur l'exploitation des ressources propres au territoire qui les contrôle (Courlet, Garofoli 1995). D'après Courlet et Pecqueur (1996), le territoire inclut des facteurs historiques, culturels et sociaux, qui sont à la base de la continuelle interaction entre la sphère économique et la sphère sociale. Le territoire est le lieu des rapports entre les hommes et les entreprises. C'est le lieu où les institutions centrales (formelles ou exogènes) doivent laisser la liberté d'action aux institutions spécifiques locales (informelles ou endogènes), à la confiance entre les agents, à la culture locale, aux traditions etc. Il est le lieu où s'organisent volontairement ou d'une manière spontanée, les formes de coopération entre les entreprises, les individus et les activités. Il est en définitive, le point de rencontre entre les formes de marché et les formes de régulation sociale (Garofoli 1996).

Plusieurs travaux se sont interrogés sur l'existence de tels phénomènes, où de nombreuses formes d'organisation productive localisée sont désormais évoquées: système territorial de production, système productif localisé (ou local), région intelligente, milieu innovateur, *cluster*, système industriel local, *sanchi*, pôle industriel de développement, district technologique ... etc. Regroupées sous la

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notion synthétique de Système Productif Local (SPL), ces configurations territoriales reposent généralement sur des Petites et Moyennes Entreprises (PME), qui entretiennent des relations entre elles et avec le milieu socioculturel d'insertion (Courlet, Soulage 1993). Ces relations ne sont pas seulement marchandes, elles sont aussi informelles et produisent des externalités positives pour l'ensemble des entreprises. Les auteurs identifient dans les territoires considérés, des effets de proximité, marqués par des jeux de concurrence-coopération entre des PME, encadrés par des instances de régulation locales, et qui s'inscrivent dans des contextes spatiaux, aux identités socioculturelles marquées. Cette dynamique de développement endogène, reposant sur l'osmose entre les entreprises et leur territoire d'enracinement, se matérialise en bout de chaîne, par un surplus d'efficacité productive (Ferguène, Hsaini 1998).

Généralement, les travaux et les monographies existants se limitent sur de simples observations, pour exposer les spécificités territoriales d'un SPL. D'après notre connaissance, les études menées ne procurent guère de statistiques concrètes, pour justifier l'existence et l'importance des différentes ressources spécifiques d'un territoire. Aucun travail ne confirme que toutes les ressources du territoire, relevant du processus économique et social, sont à la disposition du SPL en question. Pour cette raison, il apparaît tout naturel de s'intéresser à une telle problématique, et ce par une analyse de l'exemple du système productif de Textile-Habillement de Ksar-Hellal. Appartenant au gouvernorat de Monastir, Ksar-Hellal est connu en Tunisie pour son histoire passionnelle qui l'unie à l'industrie de textile. D'après les données du CETTEX¹, Ksar-Hellal occupe en 2009 la première place en Tunisie, en termes d'actifs employés en Textile-Habillement, qui représentent 3,92% de l'emploi total. Aussi, selon les données tirées auprès de la délégation de Ksar-Hellal, le SPL en question est composé en 2009 de 73 PME de Textile Habillement, et qui font employer 92,33% de l'emploi total de Ksar-Hellal. Ces entreprises sont spécialisées dans des activités précises, qui représentent les différentes branches qui composent le système productif en question, en l'occurrence: la branche Filature, Tissage, Finissage, Fabrication d'habillement et Traitement sur articles confectionnés. Certes, nous allons distinguer les caractéristiques du territoire hilalien, et ce en suivant une logique de trois sphères, qui seront les sections adoptées dans l'analyse, à savoir; la sphère industrielle, territoriale et institutionnelle. Chaque sphère regroupera en effet, les relations ayant les mêmes aspects fonctionnels, entre d'une part, les entreprises du système productif en question, et d'autre part, entre ces dernières et leur territoire d'enracinement.

1. La sphère industrielle

La sphère industrielle regroupe en effet, les entreprises d'un SPL, qui sont insérées dans une certaine logique de relation. Ces relations peuvent être des relations de sous-traitance, des relations avec des fournisseurs ou des services. Cette logique fonctionnelle renvoie à une logique verticale hiérarchique de complémentarité. D'autre part, les entreprises d'un SPL sont insérées dans une logique de coopération propre au groupe et à l'industrie à laquelle elle participe (Colletis *et al.* 1997). Enfin, des relations de concurrence s'installent entre les différentes entreprises d'un SPL, qui peuvent, toutefois, disposer d'une marge de manœuvre selon leur spécialisation. Donc, dans cette section, il s'agit d'appréhender ces relations, et d'en analyser leurs importances, au niveau du SPL de Textile-Habillement de Ksar-Hellal.

1.1. La logique de la complémentarité

Les districts industriels sont composés d'une multitude d'entreprises de petite et moyenne taille. Chacune des entreprises constituant cette «population d'entreprises» est spécialisée sur une seule ou quelques-unes des phases des processus productifs spécifiques au district. «Le district est un cas concret de division du travail localisée» (Becattini 1992b, p. 39). Il est considéré comme une filière ou

¹ Centre Technique de Textile.

une branche intégrée verticalement. Cette division du travail permet la flexibilité productive et la rapidité d'adaptation aux nouvelles conditions économiques. Les entreprises peuvent agir de manière complémentaire et, à partir de là, s'insérer dans une dynamique d'ensemble. Une telle organisation de la production en réseau, est un type d'organisation parmi d'autres (Courlet *et al.*). Marshall (1890) lui opposait la production à grande échelle au sein d'une même unité. Selon Lecoq (1991) et Maillat (1994), ce réseau, est une forme d'organisation, qui apparaît comme une alternative à la hiérarchie ou au marché.

La division du travail, dans un système productif, relève des relations input-output, qui se nouent entre les entreprises. Cependant, pour appréhender ces relations de complémentarité au sein d'un SPL, nous recourons à la notion de coefficient technique. Un tel indicateur retracera les interdépendances entre les différentes branches d'une filière, et ce à partir des achats en consommations intermédiaires réalisés par les différentes branches qui en composent. Les coefficients techniques, calculés en rapportant la consommation intermédiaire d'un produit i par une branche j (CI_{ij}) sur la production totale de cette branche j (Y_j), sont susceptibles d'identifier l'éventuelle présence des relations verticalement intégrée, qui se tissent entre les entreprises du système productif Ksar-Hellal (Fig. 1).

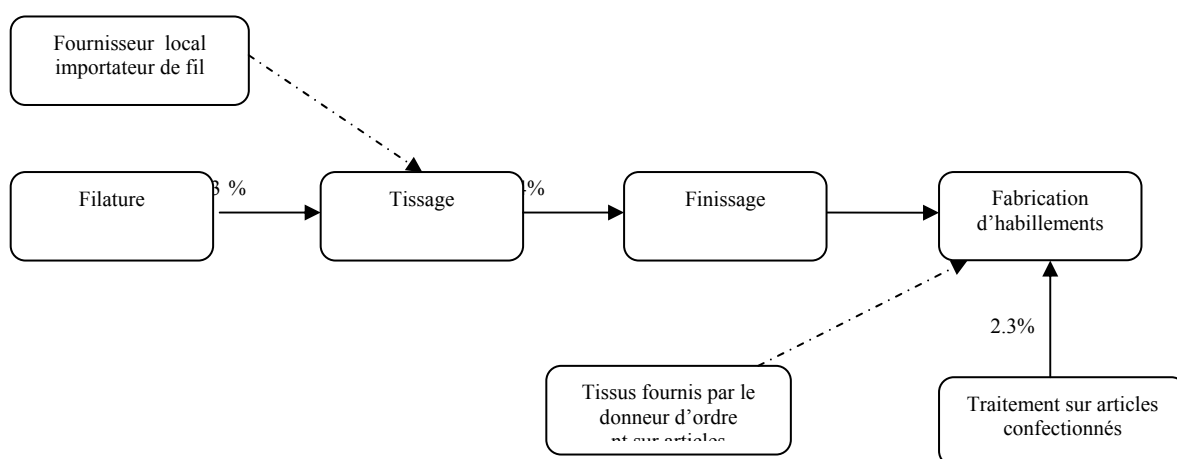


Fig. 1 – Les branches de la filière de Textile-Habillement du système productif de Ksar-Hellal en 2009.

Source: Nos propres investigations à partir des données tirées de notre enquête et des données du Bureau de Contrôle des Impôts de Ksar-Hellal (Tunisie).

D'après la Figure 1, l'analyse des coefficients techniques relatifs aux différentes branches du SPL de Ksar-Hellal, confirme la complémentarité des activités de l'industrie en question. Malgré la nuance des degrés de dépendance entre les différentes branches, on peut affirmer que le système productif de Textile-Habillement de Ksar-Hellal représente une filière, c'est-à-dire une succession d'activités qui se complètent. Certes, l'analyse recèle la cohérence du système productif hilalien de l'amont vers l'aval. En effet, une partie des fils utilisés par les entreprises du tissage, comme matière première, proviennent des entreprises locales de filature². Ce flux de matières premières, évalués par un coefficient technique de 12,3%, restent insuffisants, pour satisfaire la demande des industries du tissage. Le reste des fils utilisés provient de l'étranger, via des grossistes importateurs se trouvant à Ksar-Hellal, approvisionnant les tisseurs en quantités importantes de fils. De même, on observe la connexion de la branche de finissage avec celle de tissage, qui est traduite par un coefficient technique de 21,04%. En effet, à côté des tissus bruts, que les entreprises de finissage acquièrent de la part des branches de tissages locaux, comme matières premières, une grande partie provient de leur propre activité, puisqu'elles intègrent les deux spécialités dans leur production. Pour la branche fabrication

² Il existe deux entreprises de filature dont l'une transforme une partie de sa production de fils en tissus.

d'habillement, la principale matière première, qui est le tissu, est approvisionnée généralement de donneurs d'ordre, puisque un nombre important des entreprises opérantes travaillent en sous-traitance. Mais, une partie des tissus est fournie par des industriels hilalien, représentée par un coefficient technique de 8%, et utilisée par les confectionneurs, que ce soient leurs productions destinées totalement à l'exportation ou non. Cette complémentarité d'activités s'observe aussi au niveau de la branche traitement sur articles confectionnés. En effet, malgré la faible dépendance de cette dernière avec la branche fabrication d'habillement, appréhendée par un coefficient technique de 3,2%, une partie du service est rendu par les entreprises de traitement sur articles confectionnés. Cette faible interaction s'explique par le fait, que la majorité des entreprises de confection, surtout l'exportatrices d'entre elles, réalisent l'activité de traitement dans leurs propres établissements.

A l'issue de cette analyse, on peut avancer que malgré l'asymétrie de dépendance entre les différentes branches qui composent le SPL de Ksar-Hellal, une certaine complémentarité existe entre elles. Une telle complémentarité saisie par les relations input-output c'est-à-dire, par les flux interbranches, affirme que le SPL de Ksar-Hellal est un système productif complet. Il s'agit, en effet, d'une filière de Textile-Habillement, qui regroupe en amont, les activités de filature, au centre, les activités de tissage et de finissage, et en aval, les activités de fabrication d'habillement et de traitements sur articles confectionnés.

1.2. La logique de la concurrence

Les entreprises du district sont directement concurrentes. Cette concurrence concerne autant les biens intermédiaires que les biens destinés à la demande finale. Elle est à la fois interne et externe au district. La concurrence est un aiguillon forçant la remise en question et le renouvellement constant du district. Elle n'est pas sans effet sur le dynamisme et le renouvellement du district dans la mesure où ceux-ci « sont le fruit d'une comparaison permanente entre le *coût* de telle ou telle activité selon qu'elle a lieu au sein de l'entreprise ou qu'elle est confiée à l'extérieur » (Becattini 1992b, p. 50).

Pour mesurer le degré de concurrence sur le marché des produits, plusieurs indicateurs peuvent être évoqués. L'indice de *Lerner* (L), qui exprime la faculté qu'ont les entreprises d'augmenter leur prix (P) au-dessus de leur coût marginal (C_m), permet de mesurer le pouvoir de marché d'une entreprise. Il est égal à l'augmentation du prix au-dessus du coût marginal exprimée en pourcentage du prix³ ($L = (P - C_m) / P$). Le *mark-up*, appelé aussi facteur de marge ou marge économique, et défini comme le rapport entre prix de vente et coût marginal de production, permet d'évaluer le degré de concurrence prévalant effectivement dans les différents secteurs. La littérature s'est intéressée à cet indicateur depuis les travaux de Hall (1988) puis de Roeger (1995). Pour plusieurs auteurs (Oliveira Martins *et al.* 1996; Hylleberg, Jørgensen 1998; Przybyla, Roma 2005; Christopoulou, Vermeulen 2008), le *mark-up* semble en général refléter assez fidèlement les réalités concurrentielles des secteurs. Plus le secteur est concurrentiel, plus le *mark-up* se rapproche de 1. On trouve également, le Taux de marge (T_m), défini par le rapport entre l'Excédent Brut d'Exploitation (EBE) et la Valeur Ajoutée Brute (VAB), qui est considéré comme indicateur permettant d'apprécier l'intensité concurrentielle d'un secteur. Il reflète la part qui revient à l'entreprise dans la valeur ajoutée une fois rémunérés les salariés et payés les cotisations sociales et les impôts liés à la production. En l'occurrence, plus le T_m se rapproche de 1, moins le secteur est concurrentiel. En l'occurrence, afin d'appréhender l'intensité de la concurrence au sein du SPL de Ksar-Hellal et, en raison de la disponibilité des données, nous allons utiliser ce dernier indicateur, qui nous guidera tout au long de l'analyse.

³ L'indice de Lerner est évalué à partir de données d'entreprises. En raison des difficultés relatives à la disponibilité des données, il est approximé en général par le rapport entre l'excédent brut d'exploitation net des dépenses en capital et le chiffre d'affaires, (Nickell *et al.* 1992; Nickell 1996; Okada 2005).

Avec un Tm de 60,16%, la concurrence au niveau du SPL de Ksar-Hellal s'avère modéré (Tableau 1). Mais les résultats globaux, enregistrés au niveau sectoriel, recouvrent une situation un peu nuancée, en fonction des branches. On constate qu'on peut classer les différentes branches du système productif de Ksar-Hellal en deux groupes, selon l'importance de leurs Tm . On trouve un groupe composé de branches admettant des taux aux alentours de 50%, telles que la branche filature avec un taux de 53,56%, la branche tissage avec un taux de 50,81% et la branche finissage avec un taux de 48,58%. Un deuxième groupe regroupant des branches ayant des taux avoisinant les 60% telles que, la branche fabrication d'habillement et la branche traitements sur articles confectionnés, respectivement avec des taux de 61,82% et 63,82%. Certes, les branches filature, tissage et finissage paraissent plus concurrentielles que les branches fabrication d'habillement et traitements sur articles confectionnés. Cette différence s'explique par le fait, que la totalité des entreprises du premier groupe sont des entreprises Non Totalement Exportatrices (NTE), où la majorité de leur production reste destinée au marché local ou national. Ainsi, pour affronter le flux des produits importés, et faire face à la concurrence exercée, elles sont obligées de compresser leurs marges bénéficiaires.

Tableau 1

Les Taux de marges au niveau du Système Productif Local de Ksar-Hellal pendant l'année 2009 en %

Secteur Textile- Habillement	Branche Filature	Branche Tissage	Branche Finissage	Branche Fabrication d'habillements		Branche Traitements sur articles confectionnés	
				NTE	TE		
				60,16	53,56		50,81

Source: Nos propres calculs à partir des données tirées du Bureau de Contrôle des Impôts de Ksar-Hellal (Tunisie).
NTE: Non Totalement Exportatrice/ TE: Totalement Exportatrice.

Par un Tm de 61,82% pour la branche fabrication d'habillement, et de 63,82% pour la branche traitements sur articles confectionnés, on peut affirmer que le deuxième groupe des branches subit une pression concurrentielle, moins forte que les autres branches du territoire hilalien. Généralement, les entreprises de confection à Ksar-Hellal, sont des entreprises qui travaillent en sous traitance, où la fixation des prix s'effectue directement avec le client étranger (donneur d'ordre). Donc, elles auront une faible influence pour la concurrence exercée par des entreprises produisant pour le marché local. Pour cette raison, le Tm relative aux entreprises Totalement Exportatrices (TE) de fabrication d'habillement est de 63,87%, il est plus important que celui des entreprises NTE de la même branche qui est de 51,1%. Donc, les entreprises de confection, dont la production est destinée pour le marché local, affrontent une concurrence plus ardue, que celle affrontée par les entreprises exportatrices. De même, pour les entreprises de la branche traitements sur articles confectionnés, l'analyse montre que ces dernières enregistrent un Tm important, de l'ordre de 63,82%, mettant en exergue la faible concurrence qu'elles font face. Cette importante marge bénéficiaire s'explique par le fait que le nombre des entreprises opérantes dans branche correspondante ne dépasse pas les trois unités⁴. Donc, ils ont un pouvoir de marché important, qui leur permet de proposer des tarifs élevés sur le marché local, et augmenter ainsi leurs marges bénéficiaires, sans craindre la perte de leurs parts de marché.

En guise de conclusion, on peut admettre que les entreprises des différentes branches qui composent le SPL de Ksar-Hellal ne sont pas épargnées de la concurrence. Elles subissent une pression concurrentielle de la part de leurs rivaux implantés sur le marché local. Cette concurrence varie d'intensité selon la nature de la branche. Elle est plus intense au niveau des branches de filature de tissage et de finissage que celle subie par les branches de fabrication d'habillement et de traitements sur articles confectionnés.

⁴ Selon les données tirées auprès de la délégation de Ksar-Hellal.

1.3. La logique de la coopération

Dans le district, l'esprit d'entraide est généralement bien développé. Les entreprises du district coopèrent pour partager un ensemble d'informations spécifiques. Les coopérations sont plus fréquentes pour une plus forte synergie et une entraide plus marquée pour d'éventuels partages de ressources ou des réalisations d'opérations ou d'activités conjointes. En effet, la coopération porte sur les atouts et les problèmes communs. Les firmes réalisent des opérations conjointement, et gèrent même ensemble différentes problèmes, conflits et contingences. Elle peut par exemple porter sur la mise en place de projets communs de formation, de marketing ou de design ou simplement sur le prêt d'équipements. Ces accords sont parfois de nature formelle, mais ils sont souvent informels (Becattini 1992b). Dans un SPL, on ne peut rester sans entretenir activement des relations avec ses concurrents néanmoins alliés. L'entreprise qui ne cherche pas à cultiver ou entretenir ces liens sera exclue d'elle-même du système productif. Même lorsque la conjoncture est bonne, des problèmes peuvent se révéler si les entreprises ne coopèrent pas pour livrer à temps leurs principaux clients. Elles risquent alors de perdre ces clients, de nuire à la réputation établie du territoire entier mais aussi, de casser les liens qui existent entre elles.

La théorie spécifie trois types de coopération: la coopération horizontale, la coopération verticale et la coopération diagonale. S'agissant de la coopération horizontale, Rullière et Torre (1995) insistent, qu'il s'agit de coopération qui se manifeste entre des entreprises concurrentes, ayant décidé de collaborer ensemble pour atteindre un objectif commun. Elles peuvent concerner aussi bien des relations entre partenaires appartenant à des aires de marché différentes que, des liaisons entre concurrents directs. Pour la coopération verticale, Thoben et Jagdev (2001) stipulent, qu'il s'agit d'une coopération entre des entreprises non concurrentes du même secteur et, intervenant à différentes étapes de production. Par contre, la coopération diagonale est une coopération entre entreprises non concurrentes, évoluant dans des secteurs différents, avec des besoins et intérêts similaires dans certains secteurs (recherche, marketing). Cependant, en vue d'explicitier les rapports de coopération noués entre les entreprises du SPL de Ksar Hellal, nous allons construire un indicateur synthétique, reflétant l'intensité de tels rapports. Pour ce faire, on va s'intéresser à de types précis de coopération, en l'occurrence, la coopération horizontale et verticale, tout en négligeant la diagonale, vu que nous opérons dans le même secteur d'activité. Chaque indicateur sera construit par la moyenne arithmétique de ses propres items c'est-à-dire, des questions utilisées dans l'enquête, pondérées par leurs écarts types. Cette méthode de construction sera valable pour les deux sous-indicateurs, que pour l'indicateur global de la coopération. En effet, ce dernier sera construit en utilisant tous les items qui entrent dans la formation de ses deux sous-indicateurs qui le composent⁵.

L'analyse descriptive⁶ stipule, que la marge dans laquelle notre indicateur synthétique, la coopération globale évolue, est bornée par un minimum de 0,56 et un maximum de 1,3. En effet, en se basant sur notre échelle de mesure allant de 1 à 5, on constate que la totalité des entreprises de Textile-Habillement du territoire hilalien envisagent des liens de coopération faibles, vu que tous les indicateurs ne dépassent pas le seuil de valeur 2. Cette analyse prouve qu'il existe une coopération entre les entreprises du SPL de Ksar-Hellal mais, elle n'est pas de l'intensité pour que l'entre-aide entre les entreprises soit toujours garantie. En d'autres termes, les entreprises de Textile-Habillement de Ksar-Hellal se débrouillent dans la plupart des cas toutes seules, pour surmonter les problèmes relatifs à la production, aux équipements, aux matières premières, etc. Certes, il s'est avéré que la faible coopération entre les

⁵ Chaque question ou item de l'enquête est accompagné d'une échelle d'appréciation, afin de mesurer soit, l'importance, la fréquence ou l'intensité de la qualité correspondante. Cette échelle sera limitée par la borne 1 pour qualifier le faible niveau et, la borne 5, caractérisant le très fort niveau. Par une telle échelle, nous pouvons spécifier la catégorie à laquelle l'indicateur appartient c'est-à-dire, selon son niveau, il appartient soit à la classe de niveau faible, en appartenant à l'intervalle [0,2], soit à la classe de niveau moyen, en appartenant à l'intervalle [2,3] et enfin, soit à la classe de niveau fort, en appartenant à l'intervalle [3,5].

⁶ Nos propres investigations à partir de la base de données réalisées.

entreprises hilaliennes est due à la faible coopération verticale, qui explique 40% de la coopération globale du système productive, contre 60% relative à la coopération horizontale⁷. Un tel constat avance que la coopération entre les entreprises concurrentes du système productif hilalien, c'est-à-dire, entre celle qui appartiennent à la même branche d'activités, est plus importante de celle abordée entre des entreprises de branches différentes c'est-à-dire, non concurrentes. Ainsi, des mouvements de soutien et d'entraide sont enregistrés dans le territoire hilalien entre les entreprises de Textile-Habillement. Une telle initiative coopérative, malgré son faible niveau, caractérise surtout, les entreprises concurrentes de la même branche, qui essaient de surmonter leurs problèmes rencontrés, sans tenir compte de l'aspect compétitif qui les entoure, et tout en gardant leur indépendance et leur autonomie.

2. La sphère territoriale

Suivant Marshall (1890), la concentration d'un grand nombre d'entreprises spécialisées sur un même territoire génère des économies d'agglomération, et plus précisément, des externalités technologiques. Le district industriel bénéficie d'une atmosphère industrielle particulière, qui joue un rôle très important dans l'accumulation locale des savoir-faire. Elle permet de développer des processus d'apprentissage par la pratique, d'améliorer l'habileté (*skill*) des travailleurs et une diffusion de celle-ci au sein d'un district. Certes, en enrichissant le concept «d'atmosphère industrielle» de Marshall, les économistes italiens mettent l'accent sur l'importance des caractéristiques de la communauté locale dans le fonctionnement du district. Ils soulignent l'avantage retiré par ces territoires de la présence de fortes «valeurs partagées» dans l'apprentissage collectif, la diffusion des innovations, des compétences et des savoir-faire. Cet aspect social de l'atmosphère industrielle, découlant de l'osmose entre le système des entreprises et la communauté locale (Becattini 1992a), est une condition nécessaire pour l'apprentissage collectif dans le district (Iraldo 2002). C'est pour cette raison, que l'analyse de la sphère territoriale, appréhendée par les réseaux spatialisés de connaissance ainsi que les valeurs sociales partagées, sera une tâche primordiale, où nous essayerons d'en détecter au niveau du territoire de Ksar-Hellal.

2.1. Les réseaux spatialisés de connaissance

Dans les districts industriels, avec les externalités pécuniaires qui affectent la fonction de production, il y a des externalités technologiques qui se manifestent à travers des réseaux de connaissances (Courlet 2002). Selon Maillât (1996), les territoires n'apparaissent plus comme des supports passifs, destinés à accueillir des entreprises mobiles en raison de certaines caractéristiques de localisation déterminées et préexistantes. Ils sont comme des organisations territoriales actives, capables de créer des ressources spécifiques et différenciées et d'actionner des processus d'innovation et de développement. Le territoire constitue aussi selon Veltz (1996), une organisation dynamique active et non plus comme stock ou assemblage de ressources techniques. Concrètement, la production des ressources spécifiques n'est pas spontanée ni automatique et peut prendre de nombreuses formes (Courlet 2002). Elle peut se réaliser à partir les complémentarités entre entreprises, les institutions de formation et de recherche ou encore le passage d'individus de firme en firme, passage qui permet le perfectionnement et une spécification toujours plus poussée des savoir-faire à partir de l'expérience directe (Crevoisier *et al.* 1996; Corpataux *et al.* 1999).

C'est à partir de réseaux spatialisés générés par le contact des acteurs que l'accumulation et la transmission des savoirs s'effectuent. Selon Becattini (1987), les districts se développent en mobilisant des connaissances tacites accumulées dans le territoire plutôt que des connaissances codifiées. Pour Courlet (2002), les connaissances les plus utiles restent du domaine du tacite et se transfèrent par

⁷ Notre propre régression de l'indicateur coopération globale en fonction de ses sous-indicateurs relatif au Système Productif Local de Ksar-Hellal en 2009.

contacts. Ainsi, la connaissance est un processus complexe, où son accumulation et sa diffusion peuvent emprunter plusieurs voies, représentées par des réseaux formels et informels. En effet, c'est à travers des relations croisées avec d'autres entreprises et divers acteurs que l'entreprise peut s'approprier des connaissances tels que: centres de recherche, administrations, universités, organisation professionnelle etc. Généralement, on peut distinguer la connaissance interne tacite, externe tacite, interne codifiée et externe codifiée (Ancori *et al.* 2000; Cohendet, Steinmuller 2000). Concernant la connaissance interne tacite, elle représente le résultat de la spécialisation ancienne des entreprises, générée par le *learning by doing*. Pour la connaissance externe tacite, elle est issue des échanges continuels d'informations entre les entreprises suite à leur encastrement dans les réseaux sociaux du territoire. Quant à la connaissance interne codifiée, elle est produite par l'activité de R-D des entreprises. Enfin, la connaissance externe codifiée est engendrée de la collaboration entre les entreprises, les laboratoires de recherche et les universités.

Dans notre étude, les connaissances internes de type tacite et codifié ne seront pas prises en compte. Une telle omission est justifiée d'une part, par l'absence d'information concernant le *learning by doing*, afin d'appréhender l'information tacite et d'autre part, par l'absence des données relatives aux dépenses de R-D dans presque la totalité des firmes de textile de Ksar-Hellal, pour représenter la connaissance interne codifiée. En l'occurrence, les connaissances susceptibles d'être mises en circulation via des structures de réseaux formels et informels, dans le SPL de Ksar-Hellal, sont respectivement la connaissance externe tacite et la connaissance externe codifiée. Concrètement, La connaissance externe tacite représentera la connaissance générée par le réseau d'entreprises. Dans ce cas, le choix de l'indicateur Taux de Remplacement (*TR*)⁸, appelé aussi Taux de Rotation, sera le proxy approprié pour vérifier la présence d'une telle connaissance, dans un d'un tel type de réseau informel (OCDE, 1994). Le *TR* représente, en effet, la proportion des nouveaux employés qui ont remplacé ceux qui ont quitté l'entreprise. Sans tenir compte des raisons que ce soient; conditions de travail mauvaises, licenciement, un post mieux rémunéré ailleurs, on considère qu'un important *TR* est synonyme d'important flux d'informations tacites au sein de la firme. Ici on s'intéressera à la catégorie des ouvriers, vu que ce sont les ouvriers qui sont susceptibles de transférer les informations informelles c'est-à-dire, les habiletés acquises suite à leur expérience sur des machines qu'ils ont pratiqué. Concernant le réseau formel, il sera identifié par les relations des entreprises de Textile-Habillement de Ksar-Hellal avec toutes institutions d'enseignement ou de formation technique de domaine, et localisés dans le territoire. À Ksar-Hellal, on recense un *Centre de Formation en Textile (CEFOT)* et un *Institut Supérieur des Etudes Technologiques (ISET)*, destinés à former des diplômés spécialisés en Textile-Habillement. Dans ce cadre, la proportion des techniciens diplômés à Ksar-Hellal du total des techniciens de la firme, sera notre indicateur guide, afin d'appréhender l'importance d'une telle connaissance externe codifiée, au niveau du territoire hilalien.

Avec un *TR* de 92,15%, le nombre des ouvriers recrutés par les entreprises de Textile-Habillement de Ksar-Hellal n'arrivent pas à compenser tous les départs observés. Le non renouvellement de certains postes d'ouvriers, peut se justifier par la baisse de l'activité économique, qui découle de la crise mondiale qui en a débuté pendant l'année 2008. Cette baisse d'activité s'est répercutée sur la totalité des branches du système productif de Ksar-Hellal, où le *TR* est de 63,63 % pour la branche de filature, 87,5% pour la branche de tissage, 76,5% pour la branche de finissage, 95,2% pour la branche fabrication d'habillement et 69,23% pour la branche traitement sur articles confectionnés. Mais, avec un *TR* de 92,15%, la proportion des anciens ouvriers remplacés par de nouveaux, au niveau des

⁸ Taux de Remplacement (*TR*):

$$\left(\frac{\text{Nombre d'arrivées}}{\text{Nombre de départs}} \right) \times 100$$

où :

Les arrivées : ce sont les recrutements de renouvellement sur un poste existant et les recrutements sur création de postes.

Les départs : ce sont tous les départs que ce soient départs provisoires ou définitifs.

entreprises hilaliennes de Textile-Habillement, s'avère importante. Un tel changement de main d'œuvre est synonyme de la présence d'un considérable flux de connaissances informelles qui pénètrent les entreprises recrutantes. Il s'agit, en fait, d'un transfert d'un ensemble de savoir-faire, d'habiletés et de connaissances, maîtrisés par le nouvel ouvrier, et qui en a procuré au sein de l'ancienne entreprise. Donc, on peut affirmer, que le SPL de Ksar-Hellal est doté d'un réseau de connaissance informel, tissé par le déplacement des ouvriers d'une entreprise à une autre.

Tableau 2

Proportion des techniciens diplômés à Ksar-Hellal du total des techniciens et Taux de remplacement au niveau du Système productif Local de Textile-Habillement de Ksar-Hellal pendant l'année 2009 et en %.

	Secteur Textile- Habillement	Branche filature	Branche tissage	Branche finissage	Branche fabrication d'habillement	Branche traitements sur articles confectionnés
Taux de Remplacement	92.15	63.63	87.5	76.5	95.2	69.23
Proportion des techniciens diplômés à Ksar-Hellal	58.33	62.5	66.66	55.55	57.77	75

Sources: Nos propres calculs à partir des données tirées auprès de l'enquête.

En outre, on observe d'après le Tableau 2 que, 58,33% des techniciens embauchés par les entreprises hilaliennes sont diplômés dans des établissements d'enseignement spécialisés en Textile-Habillement, et localisés à Ksar-Hellal, tel que l'*ISET* et *CEFOT*. En effet, malgré la nuance des proportions de ses techniciens embauchés, selon la nature de la branche d'activités, telle que 62,5% dans la branche de filature, 66,66% dans la branche de tissage, 55,55% dans la branche de finissage, 57,77% dans la branche fabrication d'habillement et 75% dans la branche traitement sur articles confectionnés, les différentes entreprises hilaliennes bénéficient d'un savoir acquis, suite à un apprentissage spécifique, de la part des établissements d'enseignement sis à Ksar-Hellal. Ces établissements assurent une transmission de leurs connaissances codifiées auprès des entreprises de Textile-Habillement de Ksar-Hellal, et ce via leurs techniciens qui seront embauchés une fois terminé leur formation. Un tel réseau de connaissance assuré entre les entreprises et ces établissements d'enseignement représente la preuve de la présence d'une atmosphère industrielle, favorable à la transmission et la diffusion de la connaissance formelle. Ainsi, le SPL de Ksar-Hellal bénéficie d'une atmosphère industrielle caractérisée par des connaissances tacites et codifiées. Cette atmosphère, créatrice d'externalités technologique, trouve son origine suite aux réseaux de transmission externes, bâtis d'une part, par les entreprises industrielles de Textile-Habillement et d'autre part, par ces entreprises et les institutions de formation.

2.2. L'empreinte culturelle du Système Productif Local: Les valeurs partagées

Dans l'élaboration de sa théorie des districts industriels, Becattini (1992a) insiste sur l'origine socio-économique du concept. Il articule les traits relevant de la configuration proprement économique de l'ensemble d'entreprises et les traits se rapportant au fonctionnement social de la collectivité locale. En effet, une identité socioculturelle se construit en rapport avec la structure économique (Becattini, 1992a). Pour lui, l'existence d'une communauté locale caractérisée par un système de valeurs homogène constitue l'une des premières exigences pour le développement et la reproduction du district industriel. Ce qui permet de spécifier et de caractériser cette communauté locale, ce n'est pas l'appartenance des individus à un même ensemble d'entreprises, c'est plutôt un ensemble culturel de valeurs communément partagées telles que: l'éthique du travail et de la coopération, la puissance de l'identité collective, solidarité, famille etc. Suivant Maillât (1996), les règles, les normes et les valeurs

entrent dans l'explication des comportements des acteurs et nous éclairent dans la compréhension de leur manière spécifique d'interagir. «Elles contribuent à générer une certaine éthique du travail et des principes de confiance et de réciprocité, de solidarité et d'entraide. Elles sont particulièrement importantes en ce qu'elles participent à la création d'un espace de travail commun (rationalité commune, horizons temporels communs, objectifs communs)» (Maillat 1996, p. 14).

Grâce à une empreinte culturelle commune et à un fort sens d'appartenance, Becattini et Rullani (1995) avançaient que la division du travail entre les petites et moyennes entreprises du district existe, et non du fait de la présence de grandes entreprises. En effet, la communauté locale, le système de valeurs, la culture de l'entrepreneuriat, et la proximité spatiale facilitent cette division du travail. D'après (Becattini 1992b), le système de valeurs évolue plus ou moins au cours du temps, et son évolution ne doit pas entraver l'esprit entrepreneurial ou l'introduction d'innovations technologiques. Un corpus d'institutions et de règles se développe pour propager ces valeurs dans le district. Le marché, l'entreprise, la famille, l'église, les autorités locales et les organisations politiques permettent de transmettre le système de valeurs de génération en génération (Becattini, Rullani 1995).

Plusieurs concepts ont été élaborés pour appréhender les attributs sociaux répandus dans une société ou une communauté locale, et analyser leurs effets sur le plan économique. Chaque concept emprunte une logique spécifique et met en lumière un ensemble de valeurs partagées plus au moins différentes qui entrent dans sa formulation. On trouve le concept du «*collective programming of mind*» de la population d'un district, que Hofstede (1980) utilise pour mesurer la distance culturelle entre la population d'un district et la société globale. Aussi, Olivier (2003) identifie la notion de «*conscience de place*», où il la considère comme indissociable de la vie d'un district. De même, le concept de capital social, utilisé pour identifier le rôle des facteurs sociaux dans le succès économique, et dont sa conception diffère selon la nature de la relation sociale qui entre dans sa définition, telle que les réseaux (Granovetter 1974; Burt 1992; Degenne, Forsé 1994), la réciprocité (Gouldner 1992; Cordonnier 1997; Putnam 2000) et la confiance (Fukuyama 1995; Knack, Keefer 1997).

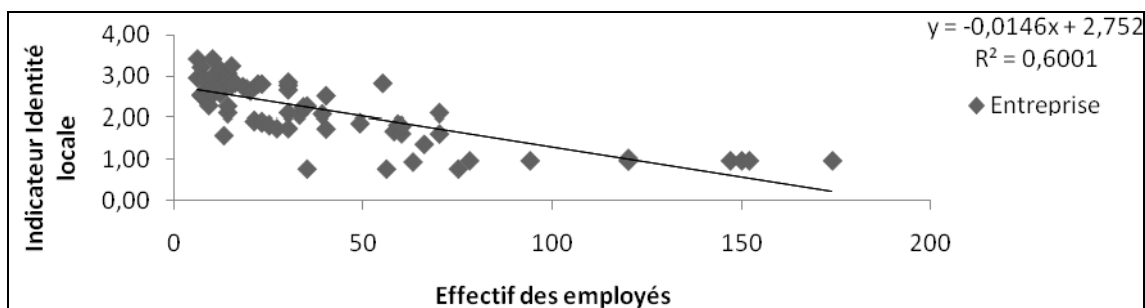


Fig. 2 – Distribution du nuage des points des entreprises du Système Productif Locale de Ksar-Hellal suivant le niveau de l'effectif et de l'Indicateur de l'identité locale pendant l'année 2009.

Source: Nos propres investigations.

Concrètement, il est difficile de construire un indicateur ou un concept qui permettrait de représenter toutes les valeurs diffuses dans une société. Il s'est avéré que chaque tentative d'identification d'un corpus de variables invisibles, dépend de la méthode et de la vision adoptée par l'auteur. C'est pour cette raison, que nous allons essayer de construire notre propre indicateur, adapté au besoin de notre étude, qui permettrait de mettre en lumière, les différentes valeurs partagées par la communauté locale du SPL de Ksar-Hellal, susceptibles suivant la théorie, de favoriser et faciliter les échanges, que ce soient matériels ou immatériels entre les firmes. Ces valeurs sur lesquelles nous focaliserons notre étude seront: la solidarité, l'action collective et la réciprocité. Ils seront les sous-indicateurs qui entreront dans la composition d'un indicateur agrégé que nous qualifions «Identité locale». On a choisi cette appellation, vu que chaque territoire a ses propres valeurs culturelles et sociales, constituant ainsi,

l'identité qui les distingue les uns des autres. La méthode d'agrégation adoptée pour obtenir notre indicateur synthétique, et similaire à celle utilisée ultérieurement et qui consiste à réaliser la moyenne arithmétique des items utilisées dans l'enquête, pondérés par leurs écart-type. La procédure de construction de chaque sous-indicateur est la même que celle qu'on utilisera dans la construction de l'indicateur agrégé.

L'analyse descriptive de notre indicateur synthétique, en l'occurrence, l'identité locale, montre que ce dernier connaît une importante disparité au niveau des entreprises hilaliennes. En effet, il s'est avéré qu'il varie entre la valeur 0,77 comme un minimum, pour atteindre la valeur de 3,41, comme un maximum⁹. En positionnant nos indicateurs sur notre échelle d'intensité¹⁰, on trouve que 39,8% des entreprises de Textile-Habillement du territoire hilalien admettent une identité locale faible, 51,8% ont une identité moyenne et 8,4% une identité forte¹¹. Encore, d'après le Graphique 1, on a pu déceler la présence d'une corrélation négative entre l'indicateur d'identité locale et la taille des entreprises hilaliennes. En d'autres termes, plus le nombre des employés de l'entreprise est important, plus elle revêt une identité locale faible. Un tel résultat conduit au fait que, plus l'entreprise est de taille, donc produisant des quantités importantes, plus elle se penche vers le côté formel dans ses relations, pour saisir l'importante masse de ses transactions et de ses échanges. Donc, plus l'entreprise est de taille, plus elle renonce aux qualités partagées au niveau du SPL et, moins elle donne de l'importance aux principes incarnés dans la population du territoire, qui sont dans notre cas la solidarité, la réciprocité et l'action collective. Ce qui explique pourquoi plus de la moitié des entreprises du SPL de Ksar-Hellal, admettent un niveau moyen d'identité locale, vu qu'elles sont généralement de petite ou de moyenne taille. En outre, la régression¹² de l'indicateur identité locale, en fonction de ses sous-indicateurs, nous fournit des estimations de telle sorte, que cette identité est construite surtout, par l'acte de solidarité enregistré entre les entreprises, qui représente 42% de l'ensemble des valeurs partagées. En deuxième position, on trouve l'action collective des entreprises hilaliennes, ainsi que la réciprocité régnante entre eux, en admettant le même poids d'importance dans le patrimoine social partagé, et ce avec une proportion de 28% pour chacune.

Ainsi, on peut confirmer que les entreprises du SPL de Ksar-Hellal sont imprégnées par certaines valeurs et normes sociales, qui fondent le patrimoine éthique du territoire hilalien. En effet, ces entreprises manifestent une certaine solidarité entre elles, et dans une moindre mesure, elles s'engagent d'une part, pour résoudre ensemble leurs problèmes, dans le cadre de l'action collective et, d'autre part, elles se rendent service, par principe de réciprocité. Une telle atmosphère embaumée par de telles qualités, ne peut que constituer un facteur incitatif, pour développer toutes initiatives de transfert ou d'échange au niveau du SPL de Ksar-Hellal, que ce soient de biens matériels, d'équipements ou de connaissances.

3. La sphère institutionnelle

À côté des institutions formelles, la régulation des processus économiques du district est dépendante des institutions informelles c'est-à-dire, des règles considérées comme un construit social (Reynaud, 1989). Becattini (1989) affirme qu'un ensemble de valeurs communément partagées par la communauté locale d'un district, permet de circonscrire les conflits d'intérêts. Selon Ménard (1990), les territoires sont des institutions c'est-à-dire, un ensemble de règles socio-économiques, visant à définir les conditions d'allocation et d'utilisation des ressources. Certes, une partie importante de la régulation des processus économiques du district est étroitement liée en un réseau de relations

⁹ Nos propres investigations à partir de la base de données réalisées.

¹⁰ La même échelle utilisée auparavant. Niveau faible, en appartenant à l'intervalle [0,2], la classe de niveau moyen, en appartenant à l'intervalle [2,3] et enfin, la classe de niveau fort, en appartenant à l'intervalle [3,5].

¹¹ Nos propres calculs à partir des tableaux des fréquences.

¹² Notre propre régression de l'indicateur identité locale en fonction de ses sous-indicateurs relatif au Système Productif Local de Ksar-Hellal en 2009.

sociales, solidement enracinées dans la culture locale (Solarì 2003). Les spécificités locales de la régulation, sont essentiellement le résultat d'institutions qui appartiennent à la société civile, en majorité de nature informelle, alors que ce sont surtout les institutions formelles qui influent sur la régulation nationale. Les mécanismes de coordinations informels sont liés aux relations de confiance ou de réputation (Dyer, Singh 1998). Certains chercheurs (Granovetter 1985; Ellickson 1991) avancent que le contrôle social souvent supplante ou supplémente les contrôles formels. Pour Messina (2001), les interactions entre les institutions formelles nationales et locales d'une part et les institutions informelles locales d'autre part sont aussi importantes, car elles contribuent à "donner une forme" à la politique locale. Selon Putnam *et al.* 1993, la relation entre institutions formelles et informelles est fondamentale pour la régulation locale. Les institutions informelles affectent l'efficacité des institutions formelles mais, c'est l'adaptation des administrations locales à la culture politique locale qui est déterminante (Putnam *et al.* 1993). D'après Assens (2003), les mécanismes de régulation sont essentiellement économiques ou sociopolitiques. Les mécanismes de régulation sociopolitiques dans les districts industriels reposent sur des fondements culturels et sur des principes sociopolitiques de type identitaires. Suivant Granovetter (1985), l'encastrement des relations sociales entre les acteurs, au sein des entreprises, favorise l'adoption de conventions de travail en dehors des principes hiérarchiques et en dehors des frontières du capital. Shapiro (1987) insiste, quant à lui, sur la notion de confiance, comme facteur de réduction d'incertitude dans l'échange, impulsé par la proximité géographique qui renforce le sentiment d'appartenance communautaire.

L'analyse détaillée des institutions qui caractérisent le système local peut être très difficile. Dans l'ensemble des formes institutionnelles, il y en a certaines qui ont une plus grande importance dans la régulation local. Il convient donc de sélectionner les éléments distinctifs. Il s'est avéré que l'étude de la régulation sur le plan local, doit prendre en considération à la fois, les institutions formelles, représentés par une autorité légale ou des règles bureaucratiques (Jones *et al.* 1997) et, des institutions informelles, appréhendées par des mécanismes sociaux, qui consistent à se servir de la confiance et à imposer des sanctions collectives, pour décourager les comportements opportunistes. L'interaction entre ces mécanismes sociaux et publics devrait réguler les comportements relationnels entre les entreprises du SPL et contrecarrer les dilemmes. Au niveau du territoire de Ksar-Hellal, nous allons construire un indicateur synthétique de la régulation qu'on nomme l'indicateur de régulation locale. Cet indicateur sera composé par l'agrégation deux sous-indicateurs; la régulation formelle, c'est-à-dire celle appliquée par les administrations publiques et juridiques et, la régulation informelle, engendrée par des mécanismes sociaux. Concernant la régulation formelle, l'efficacité des administrations locales à coordonner les interactions des acteurs sera jugée par la transparence et lisibilité de l'action publique, l'efficacité de la justice et le contrôle de la corruption. Ce sont les indicateurs qui sont communément utilisés par la BM et le MENIFI, pour analyser la qualité d'efficacité des institutions gouvernementales. Ces concepts seront adoptés comme tels sous forme d'indicateurs entrants dans la composition de notre indicateur synthétique la régulation formelle. Pour l'indicateur régulation informelle, il sera construit par l'agrégation de deux sous-indicateurs susceptibles, suivant la théorie, de réguler les comportements des firmes, et ce en se basant sur des valeurs découlant de la culture locale, en l'occurrence, la confiance et la sanction collective.

En utilisant la même technique d'agrégation adoptée dans les analyses précédentes, on constate, que le niveau de la régulation locale, enregistré au niveau des entreprises du SPL de Ksar-Hellal¹³, n'a pas dépassé le niveau de 1,77, ni tomber au dessous de 1,17. Une telle restreinte marge d'évolution, prouve le faible niveau de régulation au sein du SPL hilalien, vu que la totalité des niveaux mesurés des différentes entreprises, se trouvent à l'intérieur de la classe d'échelle allant de 0 à 2, relative à la catégorie des niveaux faibles. En outre, il s'est avéré, que 76% de la régulation des conflits au niveau du SPL de Ksar-Hellal est assurée par des institutions publiques, contre 23% suite à des règles sociaux

¹³ Nos propres investigations à partir de la base de données réalisées.

relatives au territoire hilalien¹⁴. En effet, ce sont surtout les institutions pénales, qui canalisent le comportement des entreprises de Textile-Habillement de Ksar-Hellal, vu qu'elles assument 29% de la qualité de la régulation locale¹⁵. Ensuite, c'est la qualité de contrôle de la corruption, ainsi que celle de la transparence et de la lisibilité de l'action publique, qui occupent conjointement la seconde place, dans la coordination des comportements des entreprises hilaliennes. Ces deux dernières assument chacune 23% du niveau de la régulation locale. En d'autres termes, les entreprises de Textile-Habillement de Ksar-Hellal tiennent compte, au niveau de la régulation de leurs conflits, de la présence des fonctionnaires corrompus, ainsi de la faible qualité de la mise en disposition et au courant de tous nouveaux règlements. En effet, les fonctionnaires dans le territoire hilaliens assurent leurs services publics et ce en réclamant des pots de vin, et les entreprises sont mal informées de tous changements de loi ou politique. En troisième position, la régulation des entreprises hilaliennes est garantie par un contrôle social, et ce via en l'occurrence, la sanction collective et le sentiment de confiance entre les entreprises. Ces deux institutions informelles contribuent à coordonner les interactions entre les entreprises de Textile-Habillement du territoire hilalien, et ce avec un poids chacun de 11% de la régulation locale globale. Ainsi, malgré la suprématie des institutions formelles à celles informelles, ces deux dernières concourent à la régulation des conflits d'intérêt au sein du SPL de Ksar-Hellal. En effet, il s'est avéré que la confiance et la sanction morale contribuent, à côté des institutions pénales, à la régulation des opérations entre les entreprises du territoire hilalien mais, avec une moindre efficacité.

CONCLUSION

L'analyse du territoire hilalien stipule que ce dernier est gorgé de ressources spécifiques, non susceptibles d'exister ailleurs ou d'être dupliquées. Sous réserve de leur disparité en termes d'intensité, des relations de complémentarité, de concurrence et de coopération sont détectées entre les entreprises hilaliennes de Textile-Habillement. En outre, une atmosphère caractérisée par des réseaux de connaissances formelles et informelles, règne sur le territoire en question, justifiant ainsi la présence de certaines externalités technologiques dont bénéficient les entreprises du SPL. De même, la diffusion d'une part, de certaines valeurs de culture locale sur le territoire, telles que la solidarité, l'action collective et la réciprocité, représentées par le terme identité locale, et la présence d'autre part, de certaines institutions formelles et informelles pour la régulation locale, stipule la spécificité des ressources existantes.

Certes, le territoire hilalien est un atout pour ses entreprises concentrées de Textile-Habillement. Il est le conteneur de relations marchandes et non-marchandes, qui sont uniques et échappent à une concurrence par le marché. Ces spécificités territoriales permettent de faciliter l'activité économique et d'impulser le développement d'une manière locale.

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¹⁴ Notre propre régression de l'indicateur régulation locale en fonction des sous-indicateurs régulation formelle et informelle, relatifs au Système Productif Local de Ksar-Hellal en 2009.

¹⁵ Notre propre régression de l'indicateur régulation locale en fonction des sous-indicateurs Transparence et lisibilité de l'action publique, Sanction collective, Contrôle de la corruption, Confiance, Efficacité de la Justice, relatifs au Système Productif Local de Ksar-Hellal en 2009.

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THE REORGANIZATION OF ECONOMIC ACTIVITIES IN THE APUSENI MOUNTAINS

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Key-words: economic reorganization, mining, active companies, lohn, tourism, Apuseni Mountains.

The reorganization of economic activities in the Apuseni Mountains presents several aspects of transition from the centralized economy of the communist period to the market economy after 1990, in a mining mountainous area. The present paper shows the rising of other industrial branches and of tourism development following the collapse of the mining and metal-processing industries. At the same time, small-scale individual initiative replaces the centralized decision, while the importance of external investments is still essential.

INTRODUCTION

The Apuseni Mountains represent a region in Romania of about 15,600 km². Middle altitude mountains, with large intra-montane and peripheral depressions that have allowed the practice of agriculture, these mountains have been known mostly for their mineral resources. Therefore, mining and metal-processing were the most important activities in the 20th century. Even though modern mining activities existed in this space since the 19th century, major effects were recorded following communist industrialization.

Based on traditional mining, the communist regime intensified this economic branch by planting big industries in the 1960 – 1980 period, a process that triggered migration to town of an important part of the able-bodied population and the polarization of the space. The highest employment rate was in towns and in the rural communes with mines on their territory (Beuran *et al.* 1980-1985). The problem is that those settlements were often specialized in one industrial branch alone, especially if they were small. It is the case of the communes of Roșia Montană, Almașu Mare, Lupșa (Alba County); Dobrești, Șuncuiuș, Vadu Crișului (Bihor County); Crișcior, Băița, Baia de Criș, Certeju de Sus, Luncoiu de Jos (Hunedoara County), etc.

In several towns, metallurgical plants (Zlatna, Baia de Arieș, Ștei, Crișcior, etc.) and related industries were added in order to supply the main industry with materials and parts (machine-building industry at Ștei, and Beiuș), or to use the by-products (chemical industry in Zlatna). Similarly, branches of the big textile works and food factories from cities outside the mountain area were located in the towns of the Apuseni Mts in order to balance the distribution of the workforce of both sexes. Thus, in the town of Ștei (named Dr. Petru Groza in the communist period), “Miorița” Company Oradea placed the production of knitware, and the Chemical Plant “Sinteza” Oradea its packaging section (Maier 2012); in Baia de Arieș, a classical mining town, a textile factory was opened in 1978 (Pop 1986). Besides, building-materials factories (cement, binder, refractory products), based on rocks and other materials in the area, were established in Aleșd, Aștileu and Șoimuș (Chișcăda). Forestry was centralized and timber factories in the region continued small-scale traditional activity, providing raw material for the furniture factories (Beiuș, Câmpeni, Abrud, Sebiș, Ciucea, etc.), or for big processing wood complexes located near the mountain area: Sebeș, Blaj, Oradea, Gherla, and Arad. The presence of those branches was very important for the reorientation of economic activities after the industrial collapse that followed the 1990s.

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This study is based on statistical data from the National Institute of Statistics (NIS), reports from The Ministry of Tourism, from APDRP (Payment Agency for Rural Development and Fishing), and from County Councils, as well as economic data about companies posted on the website www.listafirme.ro. The study-area includes 153 administrative units, part of six counties: Alba, Arad, Bihor, Cluj, Hunedoara and Sălaj (Fig. 2).

1. The collapse of the mining industry

Spatially, there were three major mining areas. The first area, located in the Metalliferous Mountains, had a gold-mining tradition which, according to archaeological and historical evidence, has been functioning almost permanently since the Antiquity. Mining was concentrated around Brad, Zlatna, Abrud and Baia de Arieş towns, in a so-called “golden quadrilateral”. In the communist period, besides gold and silver, the mining of complex ore held an important share, supplying the industry with raw material from national sources. The most important new location was the open pit copper exploitation at Roşia Poieni (Lupşa commune, near Baia de Arieş). At Zlatna, a processing unit for gold concentrates was being operated since the 19th century, but a newer copper ore plant (with a chemical section that produced sulfuric acid) was commissioned in 1963.

A second area of nonferrous ore exploitation was Băiţa Bihor (Nucet area). A traditional gold – silver and copper exploitation, the area registered an explosive evolution since the discovery of uranium ore after the Second World War. Huge investments and new towns emerged: Nucet and Ştei. Nucet was an extractive site and Ştei hosted a primary ore processing unit.

Another mining area, the Crişu Repede Valley, around Aleşd town, and Pădurea Craiului Mountains, was rich in bauxite ore and refractory clay. This latter resource made Aleşd area specialized in the building-materials industry. The bauxite ore extracted in the region was primary processed in Dobreşti commune and then transformed into aluminum oxide in an Oradea plant.

After 1990, transition to the market economy triggered the collapse of the heavy industry, especially the mining one. In the conditions of low productivity, the mining activity was restructured, most mines were closed down and those still operated laid off many of their employees. By the year 2006, almost all mining activities in the Apuseni Mountains had stopped. The remaining ones concentrated on explorative activities or closing/ecological cleaning of mining-affected areas (*Strategia industriei miniere pentru perioada 2008-2020*).

Afterwards, copper exploitation at Roşia Poieni (Cupru Min SA) was reopened and continued to resist, with a fluctuating workforce (420 people in 2008), due to the rising market price of copper. In the Metalliferous Mountains, geological explorations and feasibility studies showed that profitable mining was still possible in other three locations: Roşia Montană, Certeju de Sus and Bucureşti communes (Tămaş-Bădescu 2010).

Besides social protection measures, such as anticipatory retirement and compensatory payments to the lay-offs (*Strategia industriei miniere pentru perioada 2008–2020*), areas affected by high unemployment rates were declared disadvantaged, and the Government offered new investors several facilities for a period of 10 years. Under Law 20/1999, the companies in those areas were exempted from the payment of the profit tax and of custom-duties for raw materials and production equipment.

2. Reorganization of the economy

Three processes can express economic reorganization in the Apuseni Mountains: strong contraction of the previous economy, emergence of new industries and tourism.

2.1. Average number of employees and the entrepreneurial initiative

Economic reorganization was associated with 50% reduction in the number of employees at regional level (from 124,212 in 1991 to only 61,036 in 2010). As expected, disadvantaged areas registered the biggest losses of manpower, from 53,152 employees in 1991 to 21,762 in 2010 (Fig. 1). A closer look at the different disadvantaged areas shows important differences: if Alba and Hunedoara counties had initially almost the same personnel (16,448 and 16,893, respectively), in 2010, the former maintained only 4,377 people, while the latter almost twice that number (7,557). The same in Bihor, differences between the two disadvantaged areas in its mountains are huge. While the area around Aleșd town lost almost a third of its workforce (from 7,940 in 1991 to 5,368 in 2010), the Ștei – Nucet – Drăgănești area maintained only a third of its employees (from 11,871 in 1991 to 4,460 in 2010). A difference appears between the rural and the urban environment as well: with almost the same numerical workforce, the urban area appears to start recovering earlier than the rural one (Fig. 1).

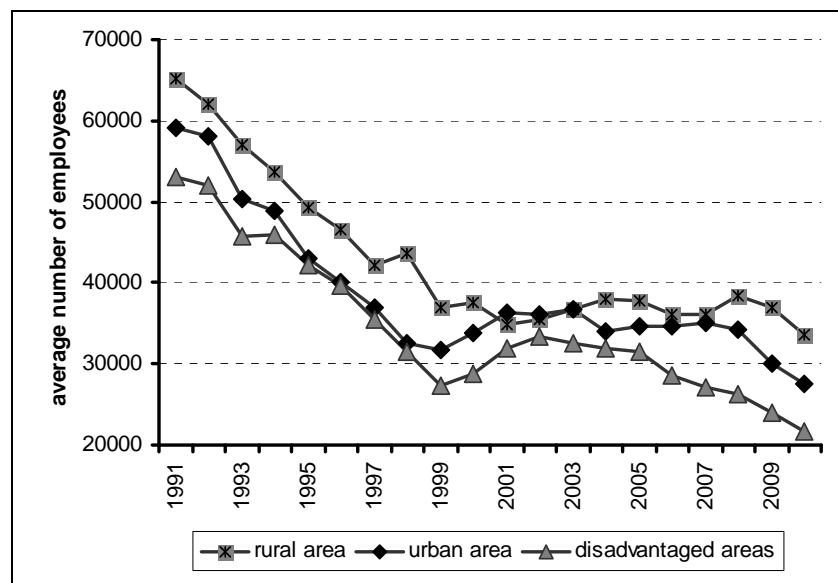


Fig. 1 – The evolution of the average number of employees in the Apuseni Mountains (source: National Institute of Statistics (NIS) data, calculations and graphical representation by the author).

At the same time, on local level, one may see winner and loser communities. If the town of Brad had almost the same number of employees in 2010 as in 1991, Ștei lost two-thirds of its workforce over the two decades. On the other hand, several rural communes registered a positive evolution during that same period. It is the case of Aușeu, Bratca, Buntești, Câmpani, Drăgănești, and Vadu Crișului (Bihor County), Săvădisla (Cluj County), Ribița (Hunedoara County) and Cricău, Galda de Jos and Vințu de Jos (Alba County). Their evolution can be explained by the presence of external investments.

In terms of employee number (Fig. 2), the best situation is in town (there are several towns with a lower employment rate, e.g. Zlatna, Vașcău and Geoagiu. The first two have not yet recovered from the collapse of mining, while the last one, raised to town status only recently, still has a rural economic structure). Usually, the present economic situation of communities in the disadvantaged area is based on the concentration of the workforce, a method used in other economic domains, too. Other towns in the Apuseni Mountains, which had an industrial tradition before 1990, still maintained their employees, especially in the wood processing sector – Transilvania Production SRL in Câmpani (furniture factory, 216 employees in 2008), Cedru Prod SRL Beiuș (133 employees in 2008), and many smaller companies in Sebiș.

Other high scores in terms of employee number are the result of a traditional activity being continued in the same location. Since after 2000 the Romanian economy grew, constructions overtook other economic sectors and the production of building-materials turned cost-effective. Nowadays, Aleșd area continues to be a traditional refractory items and cement producer (Helios SA, in Aștileu commune with 239 employees in 2008 and a cement factory in Aleșd that belongs to Holcim International Group). The same is the case of the cement factory in Șoimuș commune (Carpatcement Group).

The presence of many state employees can be another explanation for a high employment rate. In the case of Zam and Gurahonț, the hospitals on their territory make a big contribution to employment (the Psychiatric Hospital in Zam had around 200 employees) (Hunedoara County Council), the hospital in Gurahonț 49 in 2011 (Arad County Council). Beside health workers, Gurahonț commune owes its workforce to other two companies with some 50 employees each, and to many smaller companies. Moneasa, previously a spa resort, still employs many people in tourism, who work in many small guesthouses rather than in a few big hotels.

The number of employees per 1,000 inhabitants highlights other communities in which new activities are being discharged and, here and there, industries have been planted. It is the case of Galda de Jos – Vințu de Jos area which, lying near an important city (Alba Iulia) and close to the European highways and also with access to the railroad, has developed a food industry (Transavia SA, producer of chicken meat, Albalact SA, dairy producer and other smaller companies in the food sector). Building-materials are also well-represented by the Pomponio Group.

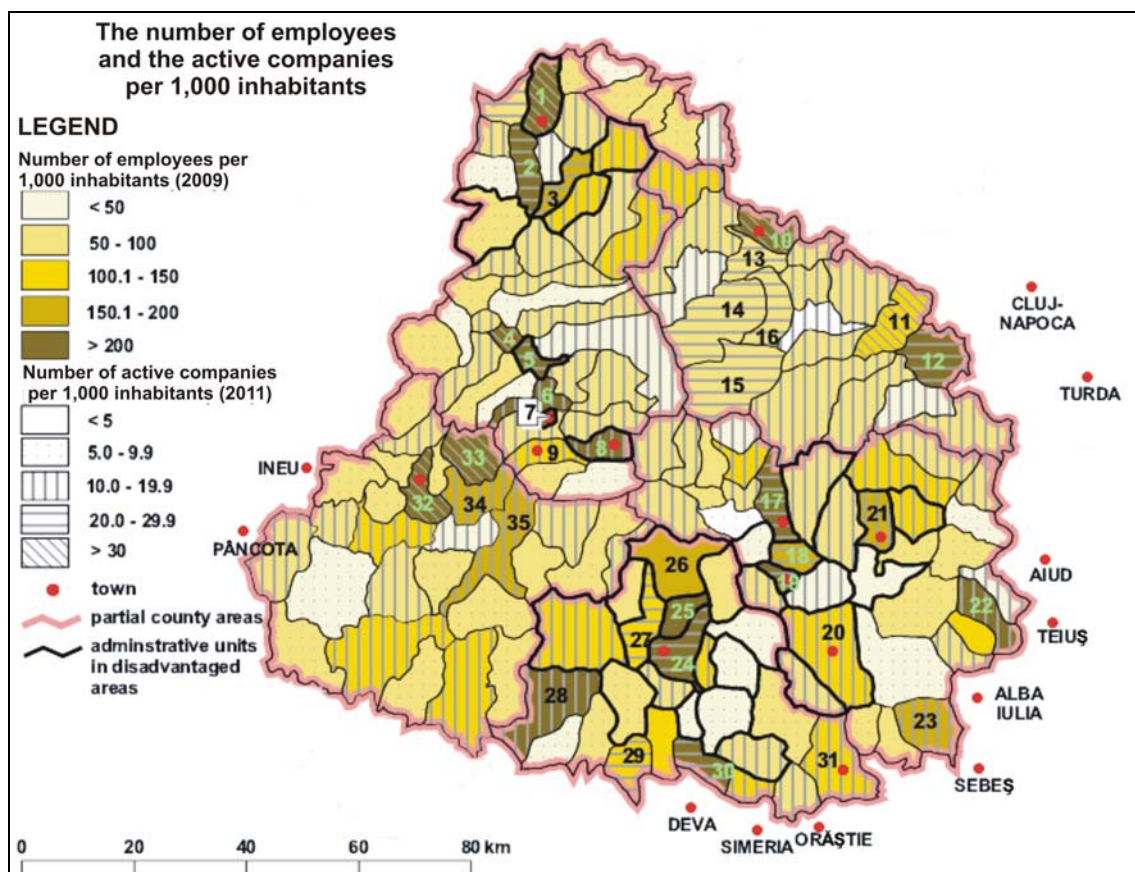


Fig. 2 – The average number of employees and of active companies per 1,000 inhabitants (source: NIS data, calculation and graphical representation by the author). Localities: 1 – Aleșd, 2 – Aștileu, 3 – Vadu Crișului, 4 – Beiuș, 5 – Drăgănești, 6 – Rieni, 7 – Ștei, 8 – Nucet, 9 – Vașcău, 10 – Huedin, 11 – Gilău, 12 – Săvădisla, 13 – Sâncraiu, 14 – Mărgău, 15 – Beliș, 16 – Călățele, 17 – Cămpeni, 18 – Roșia Montană, 19 – Abrud, 20 – Zlatna, 21 – Baia de Arieș, 22 – Galda de Jos, 23 – Vințu de Jos, 24 – Brad, 25 – Ribița, 26 – Bulzești de Sus, 27 – Baia de Criș, 28 – Zam, 29 – Iliia, 30 – Șoimuș, 31 – Geoagiu, 32 – Sebiș, 33 – Moneasa.

The case of Săvădisla is partly explicable by the presence of a big company that employs its workforce from outside the community, and of many small companies, too. Expressing the number of employees per 1,000 inhabitants may lead to some distorted values, as in the case of Bulzești de Sus, a very small commune (319 inhabitants in July 2009) with no active companies, but because many people work in the administration, it appears to have a good employment score.

In terms of entrepreneurial initiative, a statistical survey was conducted in order to identify the active companies in the area and their activity domain. Even if the Apuseni Mountains have 7,594 active companies (source: “The Complete Catalogue of Active Companies in Romania” - listafirme.ro, February 2011), most of them have less than 10 employees (92.2%), those with 10 – 49 employees representing 6.8% of the total. The companies employing more than 50 people (big companies with over 250 employees included) make only 1% of the total number of active companies with main offices in the area. There are a few big companies, but none with a mining profile e.g. Arieșul Conf SA (Baia de Arieș), Fabri SRL (Brad) and Manfred Euro SRL (Aleșd) all in the textile and footwear sector; Edy Transportation Group in Brad (with Edy International Spedition SA, Edy Logistics SRL and Autocamion Service SRL) and Transavia SA (Galda de Jos) in the food industry.

The economic statistics database that we have used registers the number of employees by the location of the company headquarters, even though the main activity has another location. In consequence, some companies appear to be located in the area, but they are not actually using mainly the local workforce. It is the case of Bechtel International Inc SRL, a road-building construction company, with headquarters in Săvădisla and a 2,377 workforce in 2009. On the other hand, companies active in the Apuseni Mountains can be missing from the catalogue if their main offices are located elsewhere. It is the case of the European Drinks&Food Group (with two industrial platforms in Rieni and Drăgănești communes), the Key Safety Systems Ro (with two factories in Brad and Ribița, and 702 employees in the automotive industry) and of the cement factories in Șoimuș and Aleșd that belong to two international groups, but statistics do not record them in the Apuseni area. Despite inadequacies, this database, together with the number of administrative employees by unit (provided by NIS), does properly reflect the economic situation of the Apuseni Mountains (Fig. 2).

As expected, active companies are more numerous in towns and in several suburban communes, or in communes more developed economically (Gilău, Iara, Poieni, Săvădisla, and Ciucea in Cluj county; Bistra, Ighiu, Galda de Jos, and Vințu de Jos, in Alba county; Gurahonț, and Târnova in Arad county; Aștileu, Bratca, Borod, Buntești, Vadu Crișului, and Lugașu de Jos in Bihor county; Șoimuș, Iliia, Crișcior, Baia de Criș in Hunedoara county). In terms of population number and active firms per 1,000 inhabitants there are no important territorial distribution variations; it only partly changes the hierarchy by promoting also communes with fewer companies but with more entrepreneurial initiative: Moneasa in Arad county and the Beliș – Mărgău – Călățele – Sâncraiu area in Cluj County (Fig. 2).

2.2. The new structure of the economy

A classification by the CAEN nomenclature¹ shows that most companies in the Apuseni Mountains (30.6%) activate in commerce (Fig. 3). Transportation and storage is well represented, too (10.7%), the processing industry 13.3%, and the extractive industry only 0.7% of CAEN classified companies in the area. Quite well-represented are the building and hotels-restaurants sectors ((9.3% and 7.9%, respectively), but only 5.3% classified companies in agriculture and forestry.

¹ CAEN nomenclature is the national equivalent of the Classification of Economic Activity in the European Community. www.listafirme.ro database does not provide CAEN classification for companies in localities with less than 10 active companies. As a result, the database does not give the CAEN code for 1,305 companies representing 17.2 % of the total.

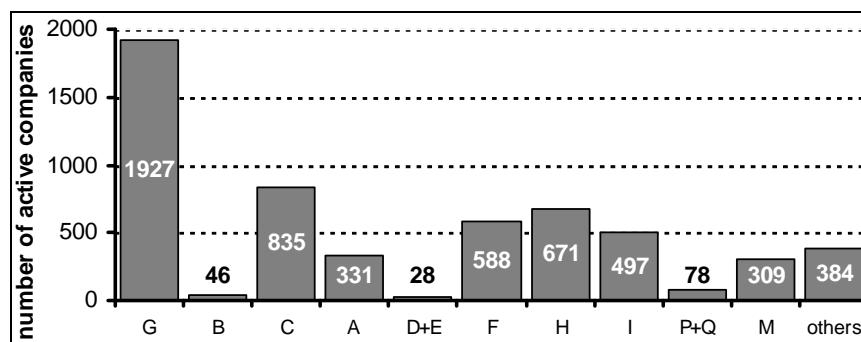


Fig. 3 – The number of active companies in the Apuseni Mountains by CAEN nomenclature (source: listafirme.ro database, calculations and graphical representation by the author).

Legend: G – commerce, B – extractive industry, C – processing industry, A – agriculture and forestry, D – production and supply of electrical power, thermal power, methane gas or water, E – salubrity, waste management, F – building, H – transportation and storage, I – hotels and restaurants, P – education, Q – medical and social welfare services, M – professional, scientific and technical activities.

Generally, most of the disadvantaged areas attracted lohn investments (industries that usually import raw materials and export manufactured goods), favoured largely by available cheap labour and exemptions from custom duties. As a result, textile and footwear replaced the mining industry (Fig. 4).

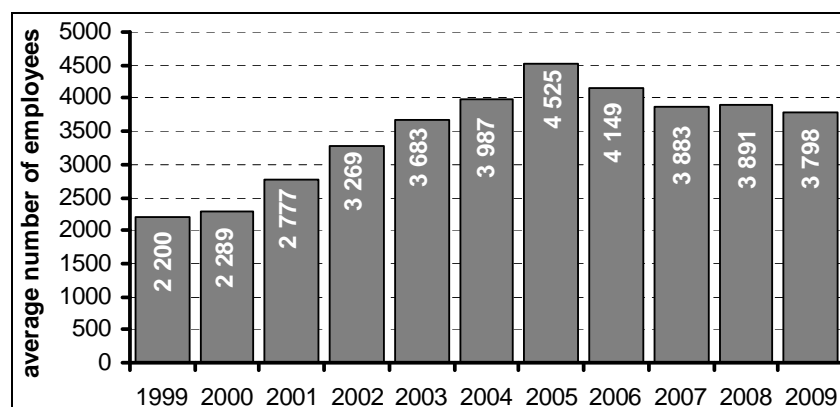


Fig. 4 – The evolution of the average number of employees in the textile and footwear industries of the Apuseni Mountains (source: www.lista-firme.ro database, calculations and graphical representation by the author). The database includes the following companies: Filatura de Bumbac Abrud SA, Arieșul Conf SA Baia de Arieș, Arieșul Prodimeș SRL Baia de Arieș, Ro.de.X Fashion SRL Zlatna, Kozara SRL Vințu de Jos, Albatex SRL Beiuș, Imagine SRL Beiuș, Italștei SRL Beiuș, Uniconf SA Beiuș, Moda Mania SRL Aleșd, Luxrom SRL Aleșd, Soletech SRL Aleșd, Vog Rom SRL Aleșd, Manfred Euro SRL Aleșd, Sarmac SRL Tinăud (Aleșd), Viriotex SRL Vașcău, Romtex Prod Impex SRL Vadu Crișului, High Tech Technosky Gilău, App Textil SA Brad, Teba Brad Industry, Fabri SRL Brad, and AS Tudor Logistic SRL.

The footwear industry (Manfred Euro SRL 830 employees in 2009, Soletech SRL 170, Sarmac SRL 172 and other smaller companies) employed much of the workforce in Aleșd and in the surrounding communes. The same, in several towns of the Metalliferous Mountains, where the previous local textile industry adopted the lohn production system, or investors opened a new lohn-based factory. It is the case of companies in Abrud (Filatura de Bumbac Abrud SA, 138 employees in 2009), Baia de Arieș (Arieșul Conf SA and Arieșul Prodimeș SRL, 309, and 98 employees, respectively in 2009), in Zlatna (Ro.de.X Fashion SRL 221 employees in 2008 and Robydav SRL) and in Brad (App Textil SA, Teba Brad Industry and Fabri SRL, with 161, 162, and 251 employees, respectively in 2009). In Ștei area, lohn companies can also be found, but here the leading role in the economic

reorganization was played by the European Drinks&Food Group industrial estates with a workforce of over 3,000 (Popa-Bota, Zotic 1998).

In the context of Romania's accession to the European Union (resulting in the systematic reduction of economic facilities for the companies of disadvantaged areas) and of the present economic crisis, the lohn industry has recently suffered a slight contraction (Fig. 4).

The analysis shows changes in the main industrial activities of the Apuseni Mountains, but the importance of non-regional investments remains essential. Since the presence of the State as industrial investor has been drastically reduced, the importance of foreign capital has grown: most of the textile factories belong to foreign investors, cement factories being now part of international groups (Holcim and Heidelbergcement). Fewer wood processing factories have remained in the Apuseni, while the new industrial units, opened in Sebeş town (Kronospan Sebeş SA and Holzindustrie Schwehofer SRL) which lies outside the mountain area, were growing fast (www.listfirme.ro).

2.3. Tourism development

Tourist tradition in the Apuseni Mountains dates to the inter-war period, Moneasa and Geoagiu Băi were known for spa therapy and Stâna de Vale for health sojourns. In the communist period, Moneasa, Geoagiu Băi, and Vața de Jos benefitted from major investments for the construction of hotels with hundreds of beds. Băișoara and Stâna de Vale were renowned winter sports resorts.

After 1990, the contraction of the national economy and the elimination of trade-union-sponsored organized tourism bankrupted most of those hotels. Only two resorts (Moneasa and Geoagiu Băi) succeeded to partially recover due to investments and PHARE funds and better promotion (Drăgan 2007).

However, it is winter resorts that recorded an upsurge, some of them remaining on the traditional location (the case of Băișoara), others developing in a new location (the case of Arieșeni – Vârtop resort). Accommodation is available mainly in villas and small hotels. Because big financial investments and exact locations are required, most local inhabitants are little interested in the development of tourism in health and winter resorts.

Instead, a new form of tourism, based on a very attractive natural and cultural environment (beautiful rural landscapes, ecological agriculture, handicrafts and folklore events) which can be more diversified in terms of spatial location has developed. It is rural tourism, with accommodation in small guesthouses available in numerous mountain households.

Starting with the assistance of international and national NGOs (Opération Villages Roumains, ANTREC – The National Association for Rural, Ecological and Cultural Tourism), rural tourism in the area has surged (Fig. 5). Agro-tourism is very suitable for mountain households to diversify their income sources and still continue to practice agriculture (studies have shown that rural tourism alone cannot support the rural household, it being only an extra income) (Benedek, Deszy 2006).

Official statistics indicate a number of 209 certified tourist units, but according to some studies official data underestimate the extent of this activity. In 2004, Rodica Petrea assumed that over 500 guesthouses existed in the Apuseni (the ones officially registered at the time, and those functioning only with mayoralty authorization or without any authorization at all). The real number today is probably larger than that; out of 144 projects for the diversification of rural activities in this area, funded by SAPARD Measure 3.4 and EARDF Measure 322, during 2002–2010, the great majority, with a few exceptions in Galda de Jos and Câmpeni, were aimed at the development of tourism.

Tourism development already shows its own regional disparities, resulting from different tourism potential in the region, and especially from the mentality and capacity of communities to seize opportunities. Even though guesthouses are spread all over the region, their density is higher in Alba County, in the Upper Arieș Valley and in Remetea commune, due to the proximity of the Apuseni Mts. Natural Park with karstic landscapes, and the Magyar cultural area with specific architecture at Remetea. Other rural guesthouse agglomerations are in the Crișul Repede Valley, Călata area, Săvădisla commune, etc. They are also numerous in spas and winter resorts (Drăgan 2007).

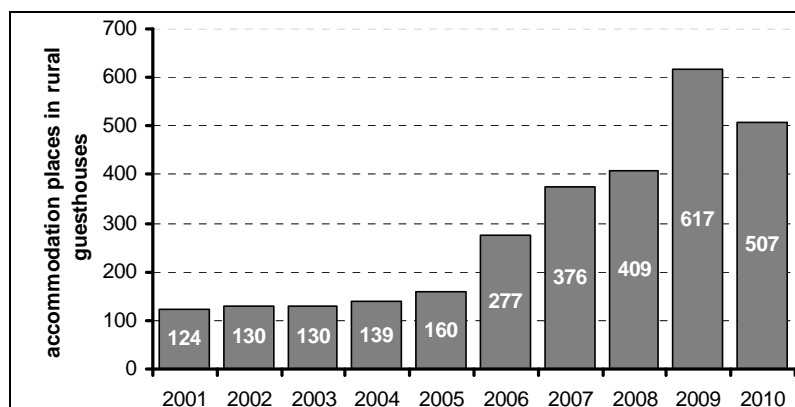


Fig. 5 – The evolution of accommodation places in rural guesthouses in Alba Apuseni (source: NIS data, calculations and graphical representation by the author)

CONCLUSIONS

In the last one-hundred years, the economic activity in the Apuseni Mountains has experienced a process of development, collapse and reorganization. In the communist period, characteristic of the region were mining and the heavy industry. Since 1990, mining registered a steep decline, its workforce being reduced by half.

At present, there is a noticeable entrepreneurial initiative all over the region. While the great majority of companies have less than 10 employees and are active in commerce, other industrial branches have emerged, e.g. the textile industry, the food industry and the automotive industry. After 1999, the lohn-based industry has become representative for the area and, once again, big factories developing, the region passed onto a new type of mono-specialization.

Rural tourism is strongly progressing, as an alternative to the resorts of the communist period. It is widely spread in space, yet some spatial disparities do exist, due to the different tourism potential and local initiative.

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PROMOTING NAUTICAL TOURISM IN ROMANIA

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Key-words: nautical tourism, promotion, Romania.

La promotion du tourisme nautique en Roumanie. Pour le tourisme nautique, la politique de promotion représente l'une des composantes les plus essentielles du développement du tourisme. Les éléments de promotion sont importants pour la création et le développement de certaines relations à moyen et long terme avec des clients éventuels. La promotion a la plus forte influence sur le tourisme de niche, comme la chasse et le tourisme de la pêche, le tourisme nautique, le tourisme d'aventure. Au cours des années, dans le but de promouvoir le tourisme nautique est plus axée non seulement sur l'information exclusive et la popularité, mais pour encourager une vraie consommation par des touristes possibles. Dans ce contexte, les actions visant à déterminer les clients potentiels d'acheter des produits touristiques spécifiques deviennent le véritable but de promotion, créé par une équipe de marketing, existent dans une agence de tourisme ou dans une entreprise importante de tourisme.

INTRODUCTION

In terms of proportions and characteristic features in different geographical areas on the Globe, water is a modelling and decisive factor in the evolution of settlements. For economic activities, including tourism, water is used by two major transportation systems and one for tourism.

The attraction for nautical tourism¹ derives from the original organization and development of tourism activities and the way of combining resources and tourist services that can provide a wide variety of tourism programs. This type of tourism relies on the existence of some certified routes of navigation, of some well-managed coastal areas and the use of certain transportation means.

In the last 5-6 decades, nautical tourism has been on greater demand after it had been included in tourist sojourn programs. Therefore, tourists may travel on land to reach sea or riversides with exceptional landscapes, or make a voyage in order to benefit from tourist services offered in harbours.

The term nautical tourism is linked to the idea of navigation, but currently yachting, navigation tourism, nautical recreation are more often used. There are also universally accepted definitions, formulated by nautical tourism experts, standing for the *sum of multi-functional activities and relations caused by the tourists mooring in or off nautical tourism harbours using vessels or other navigation facilities, for the purpose of recreation, sports or simply for the enjoyment of leisure*².

Nautical tourism is a form of tourism which beside recreational navigation, organized with one's own or rented boats, accommodation and/or overnights on board, includes also trips organized by cruising ship owners and travel agencies, cabin cruisers for the tourists' rest and recreation (e.g. fishing, scuba diving, underwater photographing). The marinas specialized in this type of tourism are seen in France, Italy, Spain, Greece, Turkey, Israel, USA, the United Arab Emirates – Dubai, Qatar –, Croatia, and Bulgaria, Pursuant to the International Council of Maritime Association – ICOMA, in 2012 there were 4,500 marinas in the EU coastal and inland waters, with a turnover of 6 billion Euros

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¹ In the literature, nautical tourism includes water activities, bathing, swimming, scuba diving and – floating and sailing with various ships.

² Luck, M. editor (2007) *Nautical Tourism: Concepts and Issues*, Chapter III, Cognizant Communication Corporation, Elmsford NY, ISBN:1-882345-50-9

for ship-building. Around 2,000 marinas are seen in Northern Europe, 800 on the shores of the Atlantic Ocean, and 1,200 in the Mediterranean Sea.

In Romania (Government Decision No. 452/2003 regarding *the development of recreational activities*) recreation represents the sum of recreational or sporting activities performed with specific equipment, and/or with nautical recreational boats in navigable national waters³. In this form of tourism, there are two essential elements – ships/ boats of any size and marinas.

Some initiatives for practicing this type of tourism have been taken in this country, too, over the last years. Gradually, there emerged a desire to build more marinas on the Romanian Black Sea coastal areas and organize a series of events devoted to nautical sports.

Thus in 2012, on Surduc Lake and its surrounding area (Timiș County), a sporting event combining an aviation show with nautical sports took place from the 30th of June to the 1st of July. It attracted for more tourists, than if the offer had been simply accommodation and participation in sports water⁴. Other nautical sporting events such as the annual festival of rowing boats in Tulcea, and the Neptun regatta at Mangalia⁵ take place on Siutghiol Lake and Snagov Lake.

In this context, nautical tourism includes an active human component (teams and beginner navigators, and licensed commanders), a passive component (passengers, tourists, and visitors who prefer boating and sailing), and the management and endowment component, that is specialized harbours and various types of boats⁶.

Distinctive elements of nautical tourism and its promotion

The notion of nautical, very much used in the specialist literature, refers to all that is connected to water, being used to identify all water-related activities and sports but, at the same time, all that refers to navigation⁷. Nautical tourism proper, includes nautical ports (marinas), yacht charter, river and maritime cruises. In relation with customers, nautical tourism contains a series of fundamental requests (harbour facilities – marinas, transportation services, parking, sheds, etc.) and additional requests (accommodation, food, extreme sports, recreation and entertainment, etc., the final purpose being to satisfy the customers).

This desideratum places in direct relationship requirements and final satisfaction likely to make the client return to the same tourist market, the same or another tourist destination very close to it; a high degree of satisfaction could decide the client to buy a tourist services package for a longer period of time and for the same destination. The phenomenon of satisfaction becomes very important by its two components: a material one (stable quality-to-price) and an emotional one (the level of satisfaction attained, maximum personal satisfaction).

Very important in all the phases of implementing the marketing mix in nautical tourism and water-based sports is the general profile of a possible client/tourist.

The profile of the nautical tourist:

- middle aged person who loves the natural environment (nature, culture, beautiful landscapes);
- prefers individual or small-group travels;
- can spend a certain amount of holiday money.

³ INCDT (2012), *Planning of integrated development of nautical tourism in Romania – 1st Stage – Development of international and domestic nautical tourism*, Bucharest, pp. 13–17.

⁴ During the 3rd edition, sail-boats, dragon boats, and nautical ski demonstrations were seen on Surduc Lake; the Timiș County Red Cross gave a drowning rescue lesson.

⁵ <http://www.nauticmagazine.ro/evenimente/concursuri/> in Romania.

⁶ Translation, adaptation and interpretation from Ludovic Tihomir, Mirjana Kovacic – *The new profile of town ports in the development of nautical tourism* – Faculty of Maritime Studies at Rijeka / Journal of Maritime Studies/UDK 656.61 Pomorstovo (Rij, 1999), God./vol. 21, no. 2/Str./all p. 232/Rijeka 2007./pp. 185–206.

⁷ Conceptual adaptation, source: Thierry Michot, article in Cahier Espaces no. 35 – *Loisirs nautiques et aquatiques*, Editions Espaces tourisme & loisirs, February 1994 – 2 pages.

In these conditions, in the marketing mix applied mainly to niche tourism, any client becomes ever more valuable as active participant in accepting and purchasing tourist products, thereby contributing to the business welfare of a tourism company or agency.

Thus, one can determine the effects of customer relationship management (CRM)⁸ for niche tourism, especially for he/she who is assessing them, effects that are expressed by:

- a more selective orientation towards various customer segments, with focus on the quality of tourist products;
- having clients really satisfied, in all development phases of a tourist product or program;
- greater responsibility of all the participants who sustain a certain tourist program – product;
- greater attention to the clients' education, professional qualification, family and social background, religion, ethnicity, incomes in order to evaluate options and specialize the tourist products;
- greater preoccupation of tourism economic operators for quality and the client, with highlight on the individual and collective satisfaction of both parties.

It follows that the best method to sell a tourism service package to a client is to concentrate your attention on the respective person to make sure that he/she will have a pleasant and appealing holiday sojourn, which is very important when a tourist product has no brand or well-consolidated image. In Romania, nautical tourism does not hold a privileged position and is not practiced by domestic tourists, but rather by those who come from other European countries. Moreover, the conditions offered by the Black Sea waters and the respective harbours are not up to the mark to those of countries where nautical tourism is already a consolidated type of tourism, with a well-defined place within the tourist industry. As regards endowment and specific services, most harbours fall into the 3rd category.

Another form of promotion is regional marketing that includes, apart from the price, also product, promotion, distribution and presentation of the region to sustain nautical tourism and its nominal capital, specific promotion approaches being required in order to create a regional brand⁹. This form of tourism also promotes the locality hosting it.

In order that this form of tourism become a hobby, customer relationship management (implemented in 1991) should become a priority for marketing specialists. Potential customers in nautical tourism are very different from those in other forms of tourism, because the aquatic environment and its specific infrastructure impose other requirements, attitudes and satisfactions.

Depending on the evolutions of the tourist markets and the competition among them, especially in what concerns the practice of this niche tourism, we may distinguish several advantages primarily for tourists but for the locals, too, such as:

- better information offered to customers concerning the particularities of the tourist products compared to others already in the market;
- greater time-and-space stability of customers for certain products on offer;
- the advantage of building direct relationships between promoters/marketers and customers;
- a better quality of services and support of innovation in all tourist activities developed on the coast, on water, and underwater;
- expanding businesses and various partnerships (public-private, private-public, and public-public), in order to accelerate direct investments;
- maintaining moderate costs and practicing prices used in the tourist market to attract different categories of customers;
- a process of promotion oriented to the customers' needs and preferences.

⁸ Better communication and customer information focuses on the implementation of customer relationship management (CRM).

⁹ *** The National Institute for Tourism Research and Development (2012), *Planning the integrated development of nautical tourism in Romania – 4th Stage/the Management of sustainable development of nautical harbours/Marketing guide for the localities that have nautical marinas*, pp. 102-111, Bucharest.

Aside from these advantages, the implementation of a customer relationship management requires that the product lifecycle be correlated with the customer's lifecycle (childhood, adolescence, youth, adulthood, old age); this proves that the new marketing mix is synchronized with product competitiveness in the tourist market, according to the customers' income and options. This aspect becomes obvious in the case of nautical tourism, because activities such as driving a boat, and practicing nautical sports are closely linked to one's age and a good physical condition.

In the near future, customer relationship marketing will become one of the essential components of the niche tourism promotion process, allowing for tourism companies and agencies to focus their action strategies on customers, by permanently innovating quality and relationships of communication and promotion.

The influence of sustainable development on the promotion of nautical tourism

Nowadays, activities and services that sustain nautical tourism and water sports imply the implementation of complex legal mechanisms which, on the one hand, are connected with the maritime and river domain and on the other hand, with the local administrations of cities and villages, and have in view environmental protection.

In summer, when the number of visitors and tourists is at its highest, conflicts may occur between boat users and the people discharging economic, commercial, transport and fishing activities. There are numerous situations in which such conflicts may develop, for example:

- lack of coherence in the local management policies of public and private terrains situated in port areas, due to the public administration system (absence of updated cadastres and of land management for the business milieu);
- ambiguities in establishing functions and activities that may be developed on any harbour precincts whatever size and draught of ship;
- the attitudes of great navigation companies that do not respect mooring rules, piloting¹⁰ and environmental protection;
- vandalism and disturbance of public quiet by visitors/ tourists temporarily anchored in port-cities;
- the seasonal character of activities in harbours and tourism which are less intense in winter than in transition seasons and summertime.

In general, it is commonly accepted that the aquatic environment (fluvial and marine) has a fragile ecological balance; man-and-climate-change-induced environmental degradation and destruction over the past few decades has been taking place at a faster pace. Therefore, harbour managers, local public administrations, the entrepreneurial milieu, town-planners, architects, builders, and tourism companies should correlate their activities in order to ensure as best as possible medium-and-long-term development of port areas and zones so as to maximize economic functionality and competitiveness.

Attaining these goals requires taking several actions, regardless of whether harbours are located in river or marine ecosystem:

- drafting a bibliographical documentation on the harbour history, development and expansion, as well as dysfunctions registered in time and space;
- elaborating a questionnaire inquiry targeting all actors of harbour-areas in order to know their future development strategies and the difficulties they are being faced with;
- defining the economic role of harbours in regional, local and national tourism;
- determining the contribution of entertainers and designing various cultural-artistic and sporting events, for the development of harbour tourism.¹¹

¹⁰ Piloting means directing the vessels to the berth and anchoring places.

¹¹ Adaptation and interpretation, source: *Guide de savoir-faire – La valorisation touristique des ports de plaisance*, ODIT, France, pdf, pp. 12–15, 2001.

All data and information obtained will contribute decisively to the elaboration of a harbour development strategy that is to include also nautical tourism and water sports, and set the directions for updating infrastructure and diversifying economic activities.

Therefore, it is necessary to determine the support capacity of each harbour, since there are lots of natural factors which can negatively influence port activities (e.g. sea level rise, strong water erosion, extreme weather phenomena, combined pollution forms, etc.).

According to EU environment directives, sustainable development of port areas requires major interventions as follows:

- the management of waste water and garbage to prevent the pollution of coastal and off-shore sea waters; all boats and vessels must clear wastes on board within the harbour area, before navigating in national and international water;
- the allocation of distinct spaces to different economic harbour functions, given that commercial and tourism activities are overlapping in the peak summer season, and slow down in winter;
- the implementation of drastic measures for pollution and polluters of port areas, measures distinct from other punitive forms, because the ecological balance being very fragile, both fauna and flora are affected;
- provision of educational and professional training to ship owners, freighters, tourists, visitors, and the local population, as well as information on ecology and environmental protection data;
- registration of an increasing number of harbours in the “Blue Flag” category, thereby improving their image for tourists and visitors.¹²

Sustainable development of port areas, irrespective of size, mooring capacity, draught of ship, the existence of urban and harbour infrastructure, city/village status, has direct advantages and a positive influence on tourism promotion, as follows:

- Improvement of the general image of a harbour and increase of its tourist activity;
- Establishment of an active communication system between all participants who contribute to the existence of the respective harbour and to local development;
- Development of nautical, sporting and cultural events, which in time should become a tradition;
- Progressive diminution of pollution sources in harbour areas, beginning with chemical pollution, the most frequent one, up to noise pollution;
- Quality improvement of principal and auxiliary tourism services, such as accommodation, food and entertainment.

Currently, two concepts sustain horizontal and vertical harbour development: the Anglo-Saxon one that stresses on closed harbour area, of high security for boats and people, and the French concept, more permissive, of an open harbour area for the public at large.¹³

Presently, the French approach is unanimously accepted, it underlining two crucial aspects, namely: the maintenance of a convivial harbour atmosphere open to various activities and access restriction and control to pontoon bridges and technical areas, anchoring, etc. Furthermore, the creation of panoramic spaces and public walking paths highlighting the cultural and natural potential of each harbour is also allowed.

This open approach requires the implementation of stricter land management rules, the careful use of existing resources, having urban-type furniture, securing watch-guard services and night lighting, that is a careful attitude meant to implement some minimal infrastructural elements for visitors and tourists. The modification of some port areas specifically for tourism, or the modernization of existing areas requires the implementation of rules for the sustainable development of fluvial and

¹² Translation and adaptation, source: Peaudeau P., Richebe R. (2002), *Le tourisme nautique – pour un développement local coordonné*, pp. 46–58, ODIT, France.

¹³ Adaptation and interpretation, source: *Guide de savoir-faire – La valorisation touristique des ports de plaisance*, in “Le Cahier de l’AFIT”, ODIT, France, p. 30, pdf, 2011.

maritime areas. Therefore, it is crucial to restore and preserve important buildings in any marina, to light the façade, maintain some traditional commercial areas and a specific harbour landscape.

Moreover, since 1999, a new management concept of port areas has been developed, namely, **the eco-harbour**. In Europe, there is a foundation, EcoPorts, to which anyone can adhere voluntarily, a good-practices guide-book being applied. At the beginning, this foundation was meant for sea port, subsequently including also river harbours. In this context, special attention has been paid to implementing more environmentally-friendly solutions for the development of marinas and tourist activities. Since 2011, the European Council has been sustaining measures to preserve the natural and cultural biodiversity and protect the environment as part of current harbour management.¹⁴

Under these circumstances, **the PERS certificate – Port Environmental Review System** may be granted after a previous analysis of all activities discharged in the respective harbour. The evaluation is made by **EPSO – European Sea Ports Organization**, which drafted a complete implementation guide in 2004. This evaluation working tool focuses on the port area – lands and water bodies, boat-harbour interactions, the analysis of coastal and off-coast zones with economic and transport roles.¹⁵ During the early decade of the 21st century, the first “land” ports emerged, in which tourist boats do not dock on water, but on shore, in specially designed places. Moreover, there is also the European Marina Federation – Euromarina, founded in 1989 with 17 permanent members.

At the same time, a project for an ecological navigation system was elaborated¹⁶, it suggesting the use of light, composite building-items, alternative renewable energy sources and of some non-water-polluting adhesives and paints. Since 2011, the cleaning of the ship bottom directly in water is forbidden in several harbours of France, Great Britain, and the Scandinavian countries, this operation must be performed only in special places, where waste water can be filtered and inside waste can be collected.

In some European harbours, car traffic has been limited in favour of public transport and urban cycling, and a pedestrian street network has been built, the aim was to reduce parking places, air and noise pollution.

The central and local public administrations involved in the management of sea and river areas have singled out the terrains on which tourist ports (marinas) can be built, or planned only for mooring/anchoring. In addition, mooring to land areas was devised to make room for other aquatic uses. In this way, pontoons and berths were left free during peak periods for commercial and tourist vessels.

In Romania, such management of marinas and environment is in an early stage. A priority is to reduce the volume of waste waters and the selective collection of waste for recycling and ecological storage.

Another aspect is the creation of **nautical resorts** focused on services and activities for people keen on this form of tourism. These resorts have in view a special program trying to operate activities during transitional seasons – spring or autumn, so as to extend the tourist season.

Elsewhere, nautical resorts are part of a tourist network, which includes other localities, too, thus broadening the offer of tourist attractions and extending the tourist season. This network does not focus on nautical tourism alone, but offers also all natural and cultural resources that can attract different categories of tourists and visitors. Therefore, infrastructural development and promotion are carried out through and with the support of this network (e.g.; the France Station – Voile Nautisme et Tourisme network).

¹⁴ At the beginning, the following harbours listed to obtain eco-harbour status: Amsterdam, Anvers, Barcelona, Göteborg, Gdansk, Hamburg, Oslo, Rotterdam, and Valencia.

¹⁵ Translation and adaptation, source: *Guide de savoir-faire – La valorisation touristique des ports de plaisance*, ODIT, France, pdf and wikipedia.org/wiki/ecoport, 2011.

¹⁶ <http://www.econav.org/?Guide-EcoNav-pour-un-bateau/fr>, 2002.

In Romania, such preoccupations began in the last decade targeting the harbours of Constanța, Mangalia, Eforie Nord – Marina Ana Yacht, Limanu marina in the small Mangalia estuary, Costinești marina and recreation area where major investments were made and others are just in progress. Small endowments have been earmarked to the Danube ports – Tulcea, Brăila, Galați, Sulina, Sfântu Gheorghe, Giurgiu, and Orșova.

Since the sea and river harbour areas do not allow for expansion beyond what has already been allocated to tourist activities, or there is no clear-cut zoning of harbour areas for economic activities, the best solution for nautical tourism to be operated at intermediate level is the creation of mixt companies.

Thus, a small local community may choose this type of organization and operation system, which relies on a public-private partnership; the head of the company, together with the main shareholders, the representatives of professional associations, NGOs and the local public administration elaborate a strategy which sets the first goals and actions for nautical tourism to become functional.

This mixt company has the advantage of being sustained by general interest, is transparent in matters of decision-making and action, can become efficient and profitable, has the capacity to attract important investors, or to get advantageous loans from the banks. Moreover, it encourages real social dialogue in order to avoid conflicts of interest and other possible conflicts with the local community. This system is working in France, Italy, Greece and Turkey.

Irrespective of the formula chosen for the existence and development of nautical tourism in port areas, there are four components of tourism sustainability:

- *The economic component*, whereby nautical tourism puts to account some aquatic and territorial areas that are less suitable for other economic activities because of lower depth, and cliffs, but may contribute to increasing occupancy in hotels, support local commercial and artisanal activities, as well as public and local services;

- *The cultural component*, basically developing a so-called maritime culture, that is a certain architecture, buildings with special functions, the maintenance of some sea-and-river – related professions and of an active cultural life – theatre, music, dance, etc.;

- *The social component* contributes to the greater stability of the local population, fewer people living only on fishing, the development of other professions required by the new tourist and nautical services incomes, and a better quality of life;

- *The environment component* involves codes of good practice in sea/river areas, both tourists and the local community members becoming more preoccupied with preserving the present quality of the environment in order to maintain its attractivity and the quality of natural and cultural tourist resources; a periodical evaluation of the state of environment is necessary in order to estimate investment effects made in time and space.

If these components are observed, any project for the development of this form of tourism will support the tourist attributes of a marina, even though it may not be particularly attractive urbanistically. Reaching a certain sustainable development level means having numerous forms of partnership and a legislation adjusted to sustain these forms. There are lots of ways of sustaining them but, a coherent and realistic project, offering a long-term perspective should be elaborated for each marina.

Romania is far from meeting these requirements, as there are no projects for all the localities on the Romanian seashore to have them developed in a complementary way, capable to diversify economic and tourist activities. Moreover, through this form of partnership there is less pressure on the natural and cultural resources and more effective land-use management.

Applying current sustainable development requirements will turn harbours into polyvalent places, open to the public at large and to private business alike. Moreover, since most urban centres are port-cities, they become entities of economic and urbanistic progress.

State-of-the-art in the promotion of nautical tourism

Neither the Romanian seaside nor the Danube River can presently be considered representative tourist products of this country in Europe or in the world, because they do not make it more competitive in this respect. There are many reasons for this situation but what is particularly obvious is the State's lack of interest for the development of tourism, the politicizing of this domain, and the absence of strategies on the part of local authorities.¹⁷

The general and the tourist infrastructure existing on the seaside and along the Danube cannot be included in the Romanian tourist brand, because there are no particular characteristics of our seaside and river areas to distinguish them from other countries; these areas cannot become attractive for various tourist segments, as they are not sufficiently promoted.

This situation is the result of the State's disinterest in the development and promotion of Romanian tourism, politicized tourism, incoherence and lack of a strategy on the part of the central authorities, repeated blocking of valuable projects and excessive focus on the projects of local communities and of local tour operators (coastal road, lake town, nautical cable ski lift, yacht marinas, etc.) rather than on smaller projects that could solve the current problems of the two tourist areas.

At the same time, the Association for the Promotion-Development of Seaside and Danube Tourism considers that lack of financing the programs and the special offers made by tourism partnerships also contribute to the present situation of the Romanian littoral area. A local and political strategy for the development of local tourism on the seaside and along the Danube was drafted in 2009; this strategy was devised and financed exclusively by the local authorities and local tourism investors (hotel keepers, tourism associations, tourism agencies, private tour operators) with direct support from the Association for the Promotion-Development of Seaside and Danube Tourism. The central tourism authorities cannot fund the projects elaborated by associations for the promotion and development of local tourism.

In order to obtain concrete and better results, it is necessary to change the legislation so that the projects of regional associations for tourism development and promotion could be sustained, which is the only effective and real formula for these geographical areas.

In this strategy, nautical tourism is presented in brief, as an opportunity for the diversification of tourist activities on the seaside and less so alongside the Danube, the river area being mentioned only for cruises from the upstream countries.

In order to elaborate a strategy for the promotion of nautical tourism, the latter should be structured on three levels (we wish to emphasize the need for effective and close cooperation between these three levels of Romanian tourism promotion):

– The promotion strategy national level is elaborated and applied mainly by the profile ministries, the main aim of tourism offices being to promote Romanian tourist products in domestic and foreign markets through tourist information and promotion offices at home and abroad; in this context, the task devolves primarily on the Romanian tourist offices abroad; an important role is also played by the profile federations but which in this country have not a unitary approach to common goals;

– The role of drafting and implementing a promotion strategy at regional level belongs to the regional promotion associations recently founded in this country; a substantial contribution have the local public administrations and the harbour management systems, for example the Association for the Promotion-Development of Seaside and Danube Delta Tourism;

– At local level, each economic nautical tourism and water-sports agent sets his own policies for tourist offers promotion, according to his specific competences; an important place is held by the partnership between tourism companies and the Federations for nautical/water sports in Romania;

¹⁷ <http://ww.capitalul.ro/macro-economie/litoralul-romanesc-un-produs-turistic-nereprezentativ-din-cauza-lipsei-de-interes-a-statalui.html>

Strategic orientations, irrespective of level, must sustain new sojourn and water trips products and services for tourists, the elaboration of programs for tourists and the local community to discover and appreciate nautical tourism, sustain the development of nautical tourism and make it safe for tourists' lives and goods.

Moreover, the service offer and promotion policy differ according to the category of marinas – for example, in very large and large marinas, where port and tourist services are more attractive, promotion will target sojourn tourists, as well as passengers that are stopping over, while in medium and small marinas, promotion will be aimed at sojourn clients.

In view of it, tourist promotion as a component of the marketing mix, consists in supplying customers with various types of information, advice and encouragements helping them to get acquainted with a specific offer, become interested and attracted by it, being persuaded that the respective offer can better meet one's expectations than others can do and decide to buy it. In order to ensure the success of promotion, *the principle of three C-s should be observed: continuity – convergence – coordination*. In tourism, two direct promotional styles are obvious:

– image promotion – with focus on tourist destinations that are to be extensively advertised as best as possible;

– sales promotion for tourists.

In the promotion policy and the means and strategies of implementing it, tourist companies largely disseminate complete information on their activity, products and services, expecting a feedback on how these products and services have been received. In this respect, the tourist company acting in a marina becomes a source of communication that aims at reinforcing its image and prestige, and also its products and services in the milieu or in the market the respective company acts in.

There are three essential messages about marinas that presumable customers should become informed on, namely:

– The marina is an active and modern economic support for a wide range of nautical activities, events, tourism services, and entertainment during the season or in extra-season, that can attract regional, but also national/international clients;

– The marina has a well-outlined tourist sector, with focus on agreement, that may improve the quality of life at local level and determine greater solicitation for the extension of residential areas and vacation dwellings;

– The marina has a valuable heritage – historical monuments, landscapes, fishing, gastronomic, and artistic traditions, and a very good tourist infrastructure.¹⁸

This is the most correct and effective practice, but, in nautical tourism, there are also other conjectural situations. In the first place, there is the property regime: in most European countries coastal regions belong to the State public domain, as they are important not only economically, but also strategically and militarily. Therefore, some coastal areas can be franchised only for a specific period of time.

In view of it, the local state institutions may develop their own businesses, beneficial for the central budget, and produce their own promotion mechanisms. In the private sector, which uses franchised marine coastal lands or riverside terrains, other actions are taken in order to make the economic activity profitable and become competitive.

Thus, a ship-owner who possesses a cruise vessel, but also pleasure-boating crafts, may manage a franchised parking-place; he may own a ship repair workshop and a pontoon for landing, also a medium-sized hotel or any type of accommodation, a restaurant, a yachting club, etc.¹⁹

¹⁸ Assessment, source: *Guide de savoir-faire – La valorisation touristique des ports de plaisance*, ODIT, France, pp. 70–72, pdf, 2011.

¹⁹ Translation and adaptation, source: Peaudeau, P., Richebe, R. (2002), *Le tourisme nautique – pour un développement local coordonné*, pp. 46–58, ODIT, France.

In these conditions, this owner may create his own tourist product and promote it by own means or through some agencies specialised in this form of tourism. This case is very frequent in France – Bretagne and Finistère, Canada, USA, Great Britain, Australia, etc. Therefore, this complete management system may engender *a local or regional brand*, a brand emphasizing the existence of a well-organized nautical system, including high-quality tourist and complementary services, active and coherent promotion.²⁰

In order to emphasize this form of tourism, tourist companies in maritime and river areas must ensure that all information promoted are coherent, because not correlating the ways and means of dissemination, the numerous information issued or, in the case of foreign markets, confrontation with the information and multitude of promotion means used by rival companies may have negative effects on the activity and prestige of the respective company.

In nautical tourism, the costs for creating a complete and attractive tourist product are high; as the weather is not predictable, the risk for the potential buyer is also high. The risk margin is high, despite active and successful promotion.

The promotional activity has also different objectives depending on the moment consumers are given specific information that is before, during and after they decided to purchase the specific tourist product. This process includes:

- influencing the purchase decision by using the AIDA principle (A – drawing attention; I – stimulating interest in the product; D – stirring up one’s desire to have it; A – buying the product/service), which suggests that the process of promotion should hold one’s attention, present interest, stimulate desire and determine action;

- the buyer’s conviction that his/her purchase decision was a good one, and that the promoted data were correct and real;

- promotion after consumption of the tourist product, through offers and updates, meetings, and greetings sent to the consumer in order to influence him/her to repeat the purchase;

These principles are also important in nautical tourism, because there are several participants in the process of achieving a complex tourist product; they should know what dysfunctions that appeared along the way which the client can reveal at the end of his/her sojourn. In this context, the information provided by customers can establish if the promotion was effective and if it needs further changes.

The process of promotion should not cease once selling has ended. In the case of tourist products there is a substantial period between purchase (booking) and the experience proper, in which interval the cognitive dissonance of the post-purchase decision should be reduced. Thus, the seller (tour-operator or tourism agency) should offer the client *information on the facilities provided while the tourist product is actually consumed and strengthen one’s conviction that the purchase decision made is a correct one*. The trip experience is modeled by the supply of additional information concerning the characteristic features of the destination and the additional services offered in order to maximize the purchaser’s satisfaction; doing it is essential in the field of nautical tourism and of water sports, as the purchase of the tourist offer supposes booking ahead navigation facilities or equipment for practicing these sports.

The tendency noted over the past few years has been to influence one’s decision-making process rather than to largely use attraction strategy, mainly because of the negative economic situation which entailed the following:

- the increase of advertising costs in the mass-media, a less efficient channel given the greater influence of digital media;

- the economic activity of many companies has been slowing down because of the same economic situation;

²⁰ ****Plan stratégique de développement et du marketing du tourisme nautique*, 2002, Le Groupe DBSF, Montréal, Canada, pdf, pp. 1–13.

– a single tourist company can take over and develop several activities in order to maximize its benefit and cover more of the customers' requests.

Choosing one of these strategic alternatives, or combining them, means using adequate promotion tools, create a promotion mix according to one's tourist objectives and distribute the promotional budget for each promotion tool and its functions.

In nautical tourism, promotional strategy should be correlated with the stages of the tourist product lifecycle, which are largely dependent on the duration at boat and vessel use, the water sports equipment employed and weather-induced damage risks in harbour areas. Indeed, in this form of tourism, the basic concept to describe a marketing strategy in terms of the evolution of the product lifecycle is the range of tourist services.

Moreover, the promotional strategy should be adapted to the specificity of each foreign market, also having in view the categories of tourists and the sociological, economic, psychological and geographical variables. At the same time, depending on the results of motivational research promotional strategy should present an attractive tourist image of the domestic offer with focus on the specific attractions of nautical tourism.

Besides, promotional strategy should underline the diversity and particularities of the Romanian tourist product, available services and options for new tourist services, diversifying the initial offer. According to the profile scientific literature, nautical tourism has several requirements for promotion to be efficient and competitive:

- good management of the tourist products on offer – accessibility, reception, guide services, accommodation, food, etc.;
- teams of entertainers specialized in navigation and water sports;
- an attractive design of boats and of stands in exhibitions and profile fairs;
- dioramas, short films, video documents presented to the public;
- promotional and relational activities performed by trainers and skippers to attract children and young people to practice water sport and navigation;

In Romania, despite the fact that some facilities for the practice of water sports and of nautical tourism do exist, yet there are no harbour poles specific to this form of tourism that would include all services necessary for a complete and attractive tourist product. Developing the nautical infrastructure represents a major challenge for the authorities. Some investments have been made over the last years at Sfântu Gheorghe, Constanța, Mangalia, and Limanu. Infrastructure is a prerequisite for the development of nautical activity, beneficial not only to boat merchants, but also to tourism, services, the real estate or building sectors, and that of the main tourist services.

The creation of real harbour poles will help diversify the range of tourist products, enable the organization of European events and favour more active promotion. In this context, powerful government support is imperative in order to build an appropriate harbour infrastructure, hardly sustainable only by the private sector or the local budgets.

There are several types of events that can be promoted in this sector:

- International events, addressed to water-sports lovers and pleasure-boaters;
- Cruises for amateurs, which have a preset itinerary and a specific time-interval from departure to arrival; the first people who arrive are given an award;
- Sporting competitions for experienced sportsmen and tourists in navigation, water sports and coasting;
- Public/private organized regattas, with the support of the local public administration and the private business sector, as well as numerous sponsorships for awards;
- Schools for motor boat and sail boat navigation, issuing licenses, schools for underwater diving and swooping, also issuing official licenses;
- Commercial events – showrooms and fairs of products designed for navigation and nautical sports, nautical holidays in marinas and in nautical and sporting clubs, fishing contests;

– Sea/river parades of old boats used in certain historical stages of harbour evolution or of maritime and fluvial navigation;

– Open Door Day to harbours, when commercial and transport departments, but also naval construction sites and repair workshops may be visited;

These events should be used and promoted in order to attract tourists who practice nautical sports, but also those who prefer activities “on the ground” and may participate in such events by paying a specific fee. Moreover, nautical events could be integrated into tourist programs that include also other activities – visits to maritime museums, botanical gardens, memorial houses; cultural and artistic evenings, creative workshops, visits to religious monuments, fairs for traditional products, practicing horse-riding, etc.

Promotion should have in view this form of tourism and its complex nature, which includes several nautical activities: on the one hand, water and recreation sports, on the other hand, tourism proper, which may contain also a cultural component. This implies a good organization of the tourist sojourn, but also a very good communication between all the actors who contribute to the creation of the tourist product. Therefore, *communication* acquires a decisive role: for example, a tourist who loves nautical tourism, but who is not informed, is a lost customer, as he will choose another destination that provides comfort and all information to enjoy good weather and moderate-swell waters for pleasure-boating or for other water-based activities.²¹

Communication is crucial as there is increasing demand for this form of tourism due to population ageing, retirement of the baby-boom generation, looking for new tourist experiences; this form of tourism is in direct competition with the tourism practiced in secondary residences, caravanning, and other forms of classical tourism. Communication allows to extend promotion from domestic to foreign markets; at the same time, specialist guide-books, Internet sites, promotion through airlines and rail companies, through the great hotel chains and tourism agencies, etc. should be improved. All in all, there are four major types of communication resources: in public spaces (events), in the prints, the mass-media (including the Internet), and promotional products (gifts and souvenirs).

The tendency is to introduce a single communication manager, in order to have complete and updated information and to accurately choose advertisements data, moreover so if they refer to a harbour or a harbour network. Communication frequently uses brochures, Internet sites, flyers, articles in the local, regional and international press, annuals, nautical guide-books, local TV and radio stations, etc. Promotion should be differentiated by age groups: about 15-35-year olds; 45-65-year olds.

In Romania, promotion of nautical tourism is still unknown to many domestic and foreign tourists; at the same time, it is insufficiently organized and has many presentation and promotion deficiencies. Besides, there are many services dysfunctions in this particular form of tourism.

CONCLUSIONS

In the current context, when also nautical transport services are globalized and extended, the tendency of expanding water tourism activities is expected to get momentum. Marinas represent a dynamic, open and complex system, with a fast-going evolution; as a result, they can satisfy more clients keen on nautical sports. Good location, modernization of the marina infrastructure, large and small boats, and moderate prices is not sufficient to attract a big number of tourists.

Promotion has a crucial role. All promotion activities must observe the characteristics of a nautical product and its customers. In this sense, it should focus on the target public, the manner of presenting available services, the prices practiced and the facilities provided to possible customers. In Romania, the development of this form of tourism is in an early stage, and its promotion by modern

²¹ Translation and adaptation, source: Paudeau, P., Richebe, R. (2002), *Le tourisme nautique – pour un développement local coordonné*, pp. 42–43, ODIT, France.

communication practices and advertising companies will evolve in terms of the spatial and temporal expansion of nautical tourism in the marinas and fluvial harbours of this country.

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ELENA TEODOREANU* ON HER 75th BIRTHDAY

Born in the town of Bălți on the 3rd of April 1938, Elena Teodoreanu graduated from the Faculty of Geology and Geography, University of Bucharest (1954–1959), Climatology Department, as head of her series.

From 1959 to 1966, her disfavoured family political background (her father was an imprisoned priest), she held several jobs alien to her geographical training. In 1966, winner of a competition brought her to the Institute of Geography, Topoclimatology Team, the only specialist team in the world at that time. Alongside her colleagues, she would take part in all field works and in pioneering topoclimatological research of the Danube Valley, the Danube Delta and especially at Pătărlagele Research Station. The fruit of this activity were some *individual or collective regional climatology studies* among which: *The climate of the Curvature Carpathians and Subcarpathians between the Teleajen and the Slănic Buzău Valleys*, 1974 (collective volume), original works of *methodology – A harmonic approach to the annual precipitation regime in the Rucăr-Bran Corridor*, 1973; *Insolation in the Rucăr-Bran Corridor* (with a colour map), 1975, etc.

Most of her productions focused on climatology research in order to substantiate the notions of *topoclimate-climatology* (e.g. *Microclimate and topoclimate*, 1971), or to elaborate *topoclimate mapping methods*, an outstanding production being *The Topoclimatic Map of Romania*, scale 1:1 500 000 (a first edition in 1970, a second modified edition in 1977), all new conceptual elements in the Romanian and foreign literature.

In 1976, at the 23rd International Congress of Geography held in Moscow, the work in which principles of topoclimatic mapping were discussed with reference to the Topoclimatic Map of Romania, scale 1:1 500 000 (in colour) was considered a novelty in the world, arousing the interest of Japanese, Chinese, Soviet and other geographers.

Elena Teodoreanu's Ph.D. thesis on the *Rucăr-Bran Corridor. A Climatic and Topoclimatic Study* (1975), supervisor Prof. Vintilă Mihăilescu, was elaborated at the Institute of Geography. The author's original contribution represents a *first climatic and topoclimatic characterisation of an elevated mountain corridor*, and a *complex outline of 2nd-order complex topoclimates by using quantity and quality indexes* (a notion introduced for the first time in the specialist literature), and a *map of elementary climates*. However, her unfavourable political dossier prevented the publication of the Ph.D. thesis.

In 1975, all research institutes ceased to belong to the Romanian Academy, falling under the jurisdiction of the Ministry of Education. This situation made Elena Teodoreanu seek employment with the Institute of Physical Medicine, Balneoclimatology and Medical Rehabilitation, Bucharest, Dept. of Natural Therapeutical Factors Research, Bioclimatology Team. In 1977 she took her Ph.D., and the Publishing House of the Romanian Academy published her doctoral paper in 1980.

It was an easy matter for Elena Teodoreanu to accommodate herself with a new professional environment, rising on the hierarchical scale from scientific researcher to senior researcher, scientific secretary of the Institute and finally, head of department, a position held from 1992 to 2003, when she retired.

Though a climatology geographer, she embarked upon a new career with focus on *Bioclimatology*, being a founder of a *bioclimatology school* at the Institute she worked in and in Romania at large. An illustration in this respect are the over 110 interdisciplinary works as single

*Ph.D., senior scientific researcher with the Institute of Medicine, Physiotherapy and Medical Rehabilitation, Bucharest; associate professor at the Ecological University, Bucharest.

author or in collaboration with other colleagues (physicists, chemists, physicians, biologists, architects and specialists in geology) together with whom she studied various bioclimatology aspects under different geographical conditions little tackled by Romanian research. Some topics of these studies were actual pioneering approaches, as is the case of research methods using *bioclimatic indexes* (thermal comfort, bioclimatic stress, etc.), *weather classes* (a worldwide practice), or spa treatment in Romania (in salt-mines, mofettes, etc.).

Studies of *Medical Geography*, carried out jointly with some physicians, looked at the correlations between the geographical environment and the bioclimatic particularities, the adaptation of the human body to various climate types (of altitude, forest, seashore, saline, etc.), or to certain elements of the climate, as well as several weather-related illnesses (rheumatic diseases, lethal myocardial infarction, the impact of canicular weather, or of total sun eclipses). These were thoroughly original topics in the Romanian literature.

Many of the results obtained were presented at national and international symposia (Japan – Fuji Yoshida; France – Montpellier, Epernay, Caen, Rennes; Italy – Genova, Rovereto; Poland – Warsaw, and Tunisia). The majority were written in Romanian and published mostly in volumes (3 as single author and 5 in collaboration), but also as articles in various journals and reviews: e.g. *The bioclimate of Romania's balneoclimatic resorts* (1984); *Balneoclimatic cures in Romania* (1984); *Spa treatment in Romania* (1985), Edit. Sport-Turism; *Balneoclimatic cure. Indications and counter-indications* (1986); *Physiotherapy, therapeutical massage, bioclimatology* (2002), Edit. Medicală. Single author: *Human Bioclimatology* (2002), *Medical Geography* (2004) (Edit. Academiei Române both) and *Climate and Man, friends or enemies?* (2011), Edit. Paideia, the last one being a scientific bioclimatic information writing. Outstanding among these works are *Human Bioclimatology* and *Medical Geography*.

Human Bioclimatology (2002) depicts the correspondence between biological and cosmic rhythms, the human body being perceived as a microcosmos, part and parcel of the macrocosmos. *The climatic elements* discussed are thermal comfort, bioclimatic stress, wind index, skin stress index, pulmonary stress, or total bioclimatic index within the context of Romania's climate, weather classes, human body caloric changes with the environment, its caloric balances being calculated under distinct topoclimatic conditions.

Other aspects refer to climatology, *climatopathology*, *climatotherapy* and *biometeorology* (depending on weather conditions and season), *climate and man's physical and affective state* (aspects of *psycho-climatology* and *aestheto-climatology*).

Medical Geography (2004) represents another interdisciplinary direction, with highlight on the influence of environmental factors (primarily climatic) on the human body and the distribution of various illnesses in the world and in Romania, related to geographical and economic-social conditions and closely dependent on the quality of life, basically life expectancy and the state of health. The author dwells on *environmental stimuli* (unorganic, organic and social), so very different on the Planet.

Since in the current living conditions some diseases, assumed to be eradicated, may return, or new ones, though not transmissible, could develop (because of alcohol drinking, smoking, drug-addiction, unhealthy eating, etc.), synergic economic, social and cultural measures should be taken at national and international level, so as to raise people's standards of civilisation, culture and sanitation and preserve the quality of the whole ecosystem.

Therefore, the two previously mentioned volumes can be viewed as *truly original specialist treaties*, attracting the interest of many specialists, and their author a *pioneer in these research areas* in Romania.

Noteworthy, the master classes in Medical Climatology (with focus on Human Bioclimatology) and the courses in Medical Geography for 4th-grade students delivered by Elena Teodoreanu at the Bucharest Faculty of Geography (1995–1998), listed for the first time in the curriculum, and

subsequently at the University of Oradea, the Bucharest Ecological University, and the Faculty of Geography of Tourism in Sibiu, where Mrs. Teodoreanu was associate professor, made her a school-founder in these domains. The example was taken over by other faculties as well, her works representing a source of documentation for anyone starting on the same path.

Similarly deserving is her contribution to raising the population's cultural and scientific level either by presenting aspects from her works of *Human Bioclimatology* and *Medical Geography* in the mass-media (various TV channels and the press), or through scientific information volumes such as: *Se schimbă clima? O întrebare la început de mileniu – Is climate changing? A question at the beginning of the Millennium* (2007); *Clima și omul, prieteni sau dușmani – Climate and Man, friends or enemies* (2011), etc., and, last but not least, as member of the Working Team of the United Nations Development Programme between 2008 and 2010.

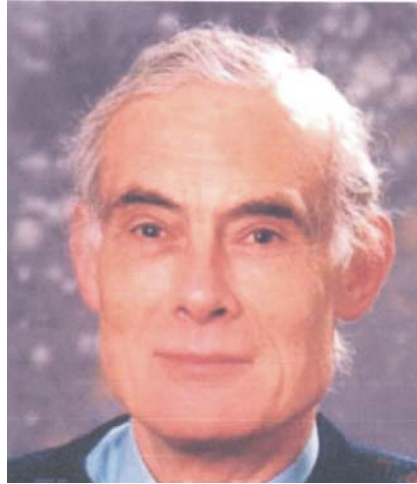
In 1995, she received the Romanian Academy's "Ștefan Hepites" Award for one of her valuable works of human bioclimatology, namely *Thermal comfort in Romania as a function of solar radiation*.

Elena Teodoreanu's merits won her numerous diplomas of excellence offered on festive occasions by prestigious national institutions: the Institute of Meteorology (1984), the Institute of Physical Medicine, Balneoclimatology and Medical Rehabilitation (1984), the Institute of Geography (1994), the Ministry of Tourism, the Institute of Tourism Research (1996), the National Conference of Balneology (1999), the Geographical Society in Romania (2000), the Faculty of Geography-Geology in Iași (2004).

At the age of 75, Elena Teodoreanu has plenty of working enthusiasm, just as she has had all her life, continuing documentation searches and writing, this time on *historical climatology*, which will certainly open up a new research direction, not yet followed in this country. We wish her good health and further success.

Octavia Bogdan

MEMORIAL DAVID TURNOCK



On September 15, 2012, the family of the late British geographer David Turnock, alongside his colleagues from the University of Leicester, Department of Geography, held a commemoration of the man who had spent forty years of his life with this institution. Since 1967, when David Turnock paid his first visit to Romania, he strived to get an insight into this country, its land and people, the result being reported in a number of 40 volumes and over 300 articles. For me, he was the most competent British geographer on Romania, and the titles of *Doctor Honoris Causa* granted by the Universities of Timișoara (2000) and “Al. I. Cuza” of Iași (2009) do but little award the abnegation of he who was so deeply attached to Romania.

In memoriam Prof. David Turnock, who left us in a tragic car accident, the Editorial Board of *Revue Roumaine de Géographie/Romanian Journal of Geography*, whose member he was for a period of 20 years, is publishing the text of David Turnock’s *Address* to the “Al. I. Cuza” University Senate in Iași (March 21, 2009), in response to a meritorious *Laudatio*, as well as the speech on *David Turnock in Romania* given at the Memorial by Șerban Dragomirescu, member of the Romanian National Committee of Geography.

ADDRESS TO THE “ALEXANDRU IOAN CUZA” UNIVERSITY SENATE

(Iași, March 26, 2009)

I am grateful to the University for its award and especially to Professor Alexandru Ungureanu for his *laudation* which shows a remarkable preoccupation with my activity in Romania which I could never have remembered myself. In this brief response I would like to situate my activity in the wider framework of U.K. geography that has always maintained a substantial interest in Europe despite its prime concerns with areas of British settlement around the world. In particular, I would refer to a period of some fifty years when regional specialisation in Human Geography was an important aspect of our discipline: from the 1930s, when Human Geography became emancipated from physical determinism to the 1980s, when computing and the Internet provided instant access to regional data

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and illustration. East-Central Europe certainly beckoned in the 1930s when the Le Play Society (inspired by the famous French sociologist) began to study the rural-urban transition in several places, including the Romanian Carpathian districts of Argeş and Harghita. The results – published just before the Second World War – were certainly an inspiration when I was starting to develop my own research activity in the 1960s. In fact these researches were probably the most notable original works produced by British geographers on Romania at this time, although there were some other studies that “reported” on the Balkan region in general, at the time the Ottoman Empire was experiencing its terminal decline and new independent nations were emerging.

The political situation is also significant as a context to my own activity from the 1960s because our perceptions of Europe at the time were dominated by the Iron Curtain and the “Cold War” between rival military and economic organisations. We had simplistic impressions of a monolithic Soviet bloc where Human Geography was bound up primarily with Five Year Plans and production achievements measured against the 1938 level. Lecturing on Europe in my first university job, I needed a broader documentation, but I also wanted photographic material at a time when colour slides were essential for illustration. There was little expertise to draw on for Romania because most specialists had been drawn to Hungary and Poland by bilateral geographical collaboration (developing only later with Romania); though some British geographers came here including Tom McGlynn – who did some original research on the colonisation of the Bărăgan – and Richard Osborne from the Nottingham University. Recently there has been some research carried out in Britain about post-war geographical activity in East Central Europe; highlighting the rather exceptional nature of travel in the Soviet sphere given the “closed” mentality of the time that inspired a feeling of imaginary “risk” of almost lunar proportions. In fact, visas were easy enough to obtain while internal travel and subsistence was facilitated by affordable accommodation and public transport, along with the “autoservire” syndrome and mass catering.

I visited East Germany, Poland and Czechoslovakia on a brief Easter holiday in 1964. And then I had the chance of visiting Yugoslavia with the Royal Scottish Geographical Society (as a tour leader) in 1965 and acquired a good stock of material there – though I had to be careful when photographing steam trains. Romania now attracted me because of its Carpathian terrain (which I had already sampled in the Zakopane area of Poland) but also its geopolitical position – linked with the Danube, the Carpathians and the Black Sea) – and its history as a nation developing from a deeply-rooted past extending back way beyond the Slavonic migrations. There was also a natural affinity between two countries at the opposite extremes of the Roman Empire. It was a very warm summer when we set off in July 1967 and we were told in Vienna that it would be “hot” in Budapest and “hotter” in Bucharest! But we arrived without mishap in Oradea and proceeded to Cluj before going farther east to Moldavia. The stopping train to Vatra Dornei brought us into contact with the “Pioneers” from Botoşani returning home from their “tabără” in Transylvania (with “Simon Templar” evidently a cult figure at the time); while an epic bus journey on the then unmodernized road through the Bistriţa gorge from Vatra Dornei to Piatra Neamţ produced an unscheduled “pauză” – to change a wheel – during which a young man introduced himself as a party activist from Iaşi. He insisted on entertaining us in Piatra Neamţ and wanted us to go with him to Iaşi: an invitation we reluctantly had to decline owing to alternative plans to see Bucharest and Braşov before returning home.

However, the visit was highly successful and we were impressed by a country that was approaching a century of industrialisation (since independence) with striking evidence of rapid urbanisation as well as rural tradition. Communist stereotypes were not as pervasive as we had anticipated and the friendly communal spirit on the bus journey from Vatra Dornei made us feel very much at home. And a few years later – after I had decided to start researching on Romania – I was able to make my first visit to this historic city. I had now made contact with the geographical establishment and was encouraged by Professor Vintilă Mihăilescu in Bucharest to come here to meet Professor Ioan Şandru who, I am delighted to hear, is still in residence at the tender age of 96! At this time I was also

in touch with younger geographers of my own age, especially Șerban Dragomirescu in Bucharest and – here in Iași – Alexandru Ungureanu: I am delighted that they are both here today.

And so my activity has continued with several subsequent visits to Iași – perhaps most notably as one of Professor Șandru’s guests in connection with a regular “summer school” programme. But this is only one part of a diverse range of experiences arising from travel opportunities facilitated by research grants (especially from the British Academy and the Economic & Social Research Council) and the cultural programme of the British and Romanian Academies; not to mention my leadership of some holiday tours and field courses. And now – five years into retirement – the “romance” with Romania is as strong as ever and, while this is due to the successful beginnings in the 1960s, there are three other considerations which maintained the momentum. First, there has been good cooperation with Romanian colleagues despite the obvious constraints of the earlier years. Apart from the contacts already mentioned I was fortunate to enjoy the friendship of a soil scientist turned geomorphologist – Nicolae Muică – who sadly passed away in Bucharest in 2008. We travelled extensively in the Carpathians and made contact with geographers across the country, including Nicolae Hillinger in Reșița and Gheorghe Ploaie in Râmnicu Vâlcea, while among the younger geographers I would refer to Remus Crețan in Timișoara with whom a close collaboration has developed in recent years. Second, Romania has furnished a succession of absorbing research themes providing ample scope for presenting the geography to a Western audience in a constructive manner (when our media is often overloaded with trivial and inaccurate material that rather misrepresents the situation in transition states). I have researched some historical topics (such as the evolution of the railway network and the spatial industrialisation process) and others with contemporary interest, including economic restructuring post-1989 (which has generated several volumes to-date) and rural studies in various Carpathian areas where the importance of agriculture has been reasserted by deindustrialisation. These latter preoccupations would obviously not have been possible without the sudden changes at the end of 1989 which has eventually resulted in Romania and UK finding themselves once more in a grand European organisation. But thirdly, and most crucially, I have enjoyed the support of my wife Marion who is here today just as she was with me on the first tour nearly 42 years ago. She has found her own interests in Romanian culture and gastronomy; not to mention social assistance projects especially in the Subcarpathian district of Pătârlagele. And so, our Romanian project continues with the encouragement that this generous award amply provides. We may now be working towards a conclusion but, if we follow the example of Professor Șandru, we may still be at the beginning.

David Turnock

DAVID TURNOCK AND ROMANIA

(Leicester, September 15, 2012)

In 1967, David Turnock, then a young lecturer at Aberdeen University, made an informal visit to Romania after having toured the other Central and East-European countries, viewing things with the eye of a professional geographer. Ever since those early beginnings he felt a special and profound attachment to Romania and its people.

What justifies my assertion is his *Address to Laudatio*, occasioned by the *Doctor honoris causa* Award received from the Senate of the “Al. I. Cuza” University of Iași in March 2009. I shall further quote from his acceptance reply: “Romania attracted me because of its Carpathian terrain (which I had already sampled in the Zakopane area of Poland), but also its geopolitical position – linked with the Danube, the Carpathians and the Black Sea, and its history, as a nation developing from a deeply-rooted past extending back way beyond the Slavonic migration. There was a natural affinity between two countries of the opposite extremes of the Roman Empire.”

I wish to add that in the years of the Iron Curtain and the Cold War, there was a short spell in Romania when life was not that unbearable, despite the oppressive totalitarian regime.

As a matter of fact, David Turnock's endeavours to get an insight into the contrastive reality of this country were in line with the growing interest shown also by other British geographers of the time, each of them, either individually or as leaders of student groups, for instance, Lord L.P. Kirwan, President of the Royal Geographical Society (London), Professors R.H. Osborne (Nottingham), J.F.E. Hamilton of London School of Economics, Th.H. Elkins (Brighton), F.W. Carter (London) and others, came to Romania for documentation purposes and for establishing contacts.

After 40 years, in a comparative attempt, David made a social-geographical monographic study of two representative Carpathian villages, the same as those surveyed by the British Le Play Society in the 1930s. The study of the Romanian rural communities remained over the years a permanent research theme in his prodigious activity.

From the early beginnings of David's activity in Romania I recall the moment of his first arrival in Bucharest when I, being absent from town to fieldwork, my parents kindly agreed to meet him at the railway station. Since they were familiar with the late 19th-century English novel, and the movies presenting its plots, they expected to see an English gentleman resembling somehow the film image, that is to say, having at least an umbrella about him. But David, dressed like a conventional European traveller, passed them by unnoticed and left the station arriving in front of our house before my parents did. Subsequently, the traditional English five o'clock tea and cakes became customary with us whenever he, sometimes accompanied by Marion, would pay us a visit while in Bucharest.

His staunchness, doubled by an exceptional memory, working capacity and stubbornness to always discover new facts, characterised David's entire activity, he being a keen observer of the ever-changing geographical reality. Any of his studies, as single author or co-author, are noteworthy for the wealth of references.

Obviously, his scientific and sentimental interest for Romania, as well as his almost yearly visits under co-operation agreements, did not escape the vigilance of the so-called *Securitate* forces. Any fieldtrip was carefully watched from a distance by the "boys". I remember, for instance, our trip in the Retezat Mountains (part of the so-called Transylvanian Alps) in the mid-1980s. The route led us onto an isolated forestry road at about 2,000 m altitude. Our Romanian Land Rover (ARO) was followed by a more powerful car, a treatment, which at the time, was reserved to all Western foreigners...

From the wide range of topics David used to tackle (and I assure you that nearly all human geography topics of historical, social and economic relevance were covered), I wish to recall his interest in making known the outstanding Romanian geographers oppressed by the totalitarian regime. It was the case of the late Professor Vintilă Mihăilescu, the tutor of many generations of Romanian geographers, myself included, and a notable adviser of foreign geographers, among whom our distinguished late friend. The Professor initiated the publication of bio-bibliographical references of leading Romanian geographers in the annual journal *Geographers – Bio-bibliographical Studies* of the IGU Commission for the History of Geographical Thought, presided over by Prof. T.W. Freeman, from Manchester University. It was David's merit to have continued publishing V. Mihăilescu's work after his death in 1978.

David Turnock's endeavours opened the way for many young Romanian geographers to be admitted to foreign programmes, such as the Erasmus Programme, and later to publish in foreign specialist journals. He was also the initiator of the first three Romanian-British bilateral geographical colloquia. On his initiative, in the 1990s, a special issue of *GeoJournal* was devoted to *The Geography in New Romania*.

Worth-recalling is David's generous assistance to the elaboration of the *National Atlas of Romania* in the 1970s, he having supervised *de bono* the English version of its texts and legends (basically 76 sheets with over 450 maps and charts), thus warranting language accuracy to this work.

The same generosity was shown by the Turnock couple when at fieldwork in the tectonic curvature area of the Carpathians and the adjacent Subcarpathian Hills. The population of this area (one of the poorest country-sides in Romania), exposed to major earthquakes, floodings and landslides, had been experiencing the effects of natural disasters. So, it was here, at Pătârlagele Town and in its surroundings that, after 1989, the couple distributed supplies (medicine for the local hospital, toys, school items, clothes for the disabled a.o.). As a matter of fact, in recent years, the locality of Pătârlagele has become a key-word for the geographical British-Romanian co-operation relations. The book on this area (*Settlement of the Pătârlagele Depression*) Romanian Subcarpathians, Lap Lambert Publishing AG, Saarbrücken, 2010), thoroughly investigated with the late Nicolae Muică, his old fieldwork companion, covers numerous topics of historical geography, toponymy, demography, social-geography, as well as ethno-geographical aspects.

Several awards have sanctioned David's authority, yet sadly enough, not acknowledged as much as he would have deserved, nor by the Romanian professional bodies either. I had the privilege to be present at the universities of Timișoara and Iași, where David was awarded the *doctor honoris causa* title in 2000 and 2009, respectively. I also remember one of the several Romanian-British history seminars (this one held in Iași) which David used to attend, and the interest aroused by David's paper on Sir Charles Hartley, who in the second half of the 19th century designed the Sulina Arm, the main transport route across the Danube Delta. Some leading Romanian historians and geographers, members of the Romanian Academy (Cornelia Bodea, Paul Cernovodeanu, Dinu C. Giurescu, Alexandru Zub, and Alexandru Ungureanu), recognized David's merits as a perfect interpreter of history, as well.

Noteworthy, he was also a remarkable collector of Romanian stamps.

To conclude, I wish to underline that Professor David Turnock's entire scientific activity relating to Romania reflects seriousness, insight, extreme correctness, and above all sincere and disinterested attachment to the Romanian people and geographers alike.

He has made an outstanding contribution to the history of Romanian geography in the last 50 years.

Șerban Dragomirescu

Sorin Geacu, *Cerbul lopătar în România* (The Fallow Deer in Romania), Editura Academiei Române, București, 2012, 387 pages, 261 tables, 117 figs., 32 colour plates.

This study, the outcome of Sorin Geacu's unrelenting research-work, represents an accurate and valuable contribution to the knowledge of a species that is of great biogeographical and hunting interest. Based on an impressive volume of concrete data, the author makes a detailed analysis regarding the situation of the Fallow Deer (an extreme case of almost fully human-controlled species), which proves man's intervention over time into the structure and dynamics of Romania's fauna. A biogeographer, specialised both in Geography and Biology, Sorin Geacu had the capacity to make quite an exhaustive approach to the issues broached.

Library and archive materials, many original information obtained from forestry and hunting experts, as well as field investigations across the country underlie the rich information provided by this work.

The First Part of the book contains general data on the distribution of the species in Europe, beginning with the earliest colonisations dating to the Antiquity, colonisation of new areas simultaneously with the numerical diminution of effectives in their places of origin, the spread of the Fallow Deer having become a wholly artificial matter. Biological and ecological particularities, the natural background of colonisation sites in Romania (with highlight on favourable or adverse conditions for the existence of the herd), general landmarks of colonisation actions in Romania, in Europa and elsewhere in the world, and finally general elements of population dynamics in Romania between 1918 and 2010 (when the study was concluded) are all aspects dealt with herein.

The Second Part, more substantial, makes an in-depth analysis of the characteristic features of the Fallow Deer populations in the wild found in Romania's major provinces (Crișana, Muntenia, Banat, Oltenia, Dobrogea, Transylvania, Moldavia and Bucovina), with emphasis on the natural living conditions of each population, the first colonisations, population dynamics (natural increase, or decrease of effectives through adverse natural conditions, as well as attacks by predators, poaching and legal overhunting), sex-ratio, number of hunted specimens, natural habitat expansion or individual captures for other sites.

Noteworthy, the huge number of digital data (tables) the analysis is based on, the maps of colonisation points, current or past colonisation sites, migration directions, places of mating, etc. are also discussed in great detail.

The Third Part expounds on the populations held in enclosures or zoos. A special mention for Charlota Park (Timiș County), which provides specimens to be introduced in Romania or abroad.

The Fourth Part refers to extinct populations, causes of decline and disappearance from their ecosystems are illustrated by 38 cases identified and described by the author. Among them, five populations had lived more than 50 years before being doomed to extinction; eight populations had resisted for 30-50 years, sixteen for 15-29 years and nine for less than 15 years.

As a conclusion, the author appreciates that, by and large, the introduction of the Fallow Deer in Romania has been a success, this species having become a stable element of the leafy forests zoocenosis despite spatial isolation, which makes the territory of the species in the wild very much fragmented. There are significant numerical fluctuations of effectives, some showing natural increases, others regressing. All in all, one might say that human influence on biodiversity proved to be positive in this case.

This volume, which also benefits from an excellent graphical presentation, unveils Sorin Geacu's passion for deep-going approaches, minutest details, as well as a mature capacity to depict the mutual relationships among natural population dynamics, certain natural phenomena and various human actions.

The present study, of great theoretical relevance for the capacity of a colonised and carefully controlled species to harmoniously integrate into the natural landscape, is also a documentary source for anyone interested in the general or local ecology and dynamics of the Fallow Deer in Romania.

Cristina Muică

Mihaela Rodica Persu, *Depresiunile subcarpatice oltene dintre Jiu și Bistrița Vâlclii. Geografie umană* (The Subcarpathian depressions of Oltenia between the Jiu and the Bistrița Vâlclii rivers. Human geography), Editura Universitară, București, 2012, 242 pages, 82 figs (of which 1 colour), 50 photos, 5 tables.

Developing and managing the rural areas is one of the complex issues nowadays, it involving, on the one hand, a balanced solution between the conservation of the country's economic, ecologic and socio-cultural rural space, and on the other hand, the need to update rural life. The present paper falls in line with research into the rural reality of Romania and offers a comprehensive picture of the Subcarpathian depressions of Oltenia in a comparative approach to the evolution of their natural, human and economic potential.

The problems discussed are based on a serious documentation from the profile literature, as well as on the collection, processing and geographical interpretation of a vast amount of statistical data and field-work. There are over 200 bibliographical references, suggestive photographic images, GIS-related cartographic representations and numerous charts.

Rev. Roum. Géogr./Rom. Journ. Geogr., **57**, (1), p. 85–89, 2012, București.

The ten chapters of this volume contain detailed analyses of the evolution, structural-functional and typological aspects of the study-area; the introductory chapter acquaints the reader with the rationale of the author's choice of the subject-matter and the arguments sustaining it.

Chapter one has a theoretical methodological section, a chronology of the profile works studied, and an outline of this Subcarpathian area's geographical personality.

Chapter two presents the geographical position of the Subcarpathian depressions of Oltenia within Romania and the Getic Subcarpathians, delimiting and structuring sub-units in terms of communication routes and administrative make-up.

Chapter Three, suggestively titled *Favourable and restrictive natural factors in the enlargement of the human habitat*, makes an analytical overview of the main environmental components directly connected with the humanisation of the Subcarpathian region studied.

Chapter Four, structured alike to monographic works, deals with the history of people's settlement in the area, the formation and evolution of the settlement network intimately correlated with natural conditions.

Chapters Five and Six are the most extended ones numerically and important in content, diagnosing human potential (numerical evolution of the population, demographic movements, human pressure on the territory, demographic structures and behaviour, migration), analysing the main features of the settlement network – dissemination and altitudinal distribution of settlements; demographic, morphostructural and functional typology; territorial distribution of towns and their demographic size, functional zonality, urban development level and the rural-urban ratio. The author takes a comparative view of the evolution of population and habitat with highlight on the post-communist period. The recent evolution of the settlement network is shown to be increasingly influenced by economic and socio-political factors, local interests focusing on making best use of natural and human resources, an aspect that will obviously count in the region's new territorial organisation.

Chapter Seven is devoted to economic activities, particularly agriculture, industry and tourism, and their role in the organisation of the territory; also, a typology of settlements is being presented based on the interpretation of statistical indicators obtained by processing statistical data.

Chapter Eight expounds on the socio-cultural infrastructure with focus on education and health care, the area's cultural geography, basically customs, traditions and crafts.

Chapter Nine and Ten represent a synthesis of the previous topics of this work, together with a SWOT analysis of opportunities and hazards, favourable and restrictive elements in setting the strategies of territorial regionalisation and development of the local communities with a view to their hierarchisation.

The geographical specific of this study has imposed using various-scale mapping techniques in order to outline the characteristic phenomena discussed herein, offering a visual picture of details and general elements.

Persu's own conclusions underline the need for the region's future development by relaunching traditional economic activities, mainly shepherding and ecological agro-tourism which may turn out to be a representative economic occupation in this area.

The Subcarpathian depressions of Oltenia between the Jiu and the Bistrița Vâlcii rivers. Human geography constitutes a complex and valuable work with a wealth of data and scientific information that add new, practical attributes to the regional sustainable development strategy, to geographical knowledge and interpretation generally.

Daniela Nancu

Nicoleta Damian, *Mediul geografic și factorii de risc social din Delta Dunării* (The Danube Delta – Geographical Environment and Social Risk Factors), Editura Universitară, București, 2013, 264 pages, 116 figs., 30 tables.

The deep-going mutations registered after 1989 have opened up new vistas for research into the man-environment relations and the human impact on the components of the natural environment, in particular.

The present study falls in line with this general framework and makes a comprehensive and detailed analysis of the delta system and the complex phenomena facing it after the fall of ideological barriers and the generalisation of globalising connections. In the seven chapters of this volume the author discusses the case of the Danube Delta in Romania.

Noteworthy is the effort made by the author to gather, select, and synthesise information on an area marked by profound 20th-century mutations. Although the study-area is not a very large one, yet the work adds real and recent theoretical-methodological knowledge to the profile geographical literature in a modern and all-inclusive presentation.

Since this analysis is not simply geographical, but tackles also sociological and economic aspects, the study obviously acquires a multidisciplinary character, a remarkable endeavour in the Romanian geographical literature devoted to the complex interactions within fragile natural ecosystems, with highlight on the structure and particularities of the deltaic ecosystem and its spatial and temporal links with the limitrophe spaces. In this work one also finds a coherent data-base on the origin, particular aspects and consequences of spatial disparities in the Danube Delta, as well as the role of endogenous and exogenous factors underlying them. The reader will also become acquainted with modern concepts on spatial development in the light of the complex functional relationships established among the various components of the geographical environment, the historical and quantitative geo-demographic and geo-economic impact on the Danube Delta natural components and its neighbouring areas.

The first section of the book provides a many-sided analysis of the Danube Delta's geographical position, a historical overview of research, the main features of the area's relief, climate, waters, vegetation, fauna and soils. Next, the analysis is enlarged at macro-territorial level: the particularities and importance of the deltaic system at the mouths of the Danube in the light of wetlands and their international importance (Ramsar Convention and UNESCO natural sites the Danube Delta is part of). Furthermore the discussion focuses on the environmental factors impacted by human activity, the quality of the environmental components (water, air, soil and biodiversity), the intensity and spatial distribution of human pressure, the quality of the technical-urbanism and transport infrastructure, the economic and environmental policies. A distinct chapter expounds on the quantitative and qualitative aspects of social risk factors in the Danube Delta (demographic: infrastructural development; economic and political; land management and fishing – the main resource in the Delta and the economic policy related to it), the dynamics and geographical distribution of social risks: poverty, unemployment and social conflicts.

In view of the above, tourism is being suggested as development alternative, a chance for the local communities to prosper, but also a risk for the natural components in case tourist fluxes are not managed in an appropriate manner. The last chapter deals with projects, programmes, international conventions and agreements on wetlands, which Romania is a signatory to, and their implementation in the Danube Delta ecosystem after it had been listed among the biosphere reserves under the "Man & Biosphere" Programme and declared a wetland of international value, mainly as water-fowl habitat (Ramsar Convention, September 1991), as well as World Natural Heritage (UNESCO list); the Danube Delta together with the Razim-Sinoe Lagoon Complex having become a Biosphere Reserve are sites of worldwide importance.

As a conclusion, we would say that the structure, field surveys and bibliography, the pertinent and critical analyses, suggestive graphical material and illustrations, the specific data-base elaborated, the synthetic comprehensive approach, and not least the logical presentation of the complex problems and relationships among various elements makes Mrs. Damian's works a relevant scientific achievement for the Romanian and foreign geographical literature alike.

Radu Săgeată

Gheorghe Kucsicsa, *Parcul Național Munții Rodnei. Relații om–mediu* (Rodna Mountains National Park. Man-environment relations), Editura Universitară, București, 2013, 168 pages, 108 figs and graphs.

This original approach to a very complex and topical problem is quite remarkable for logical structuring and the remarkable complementarity between text and maps.

A researcher at the Romanian Academy's Institute of Geography, the author interprets quantitative analysis in the light of geography, which makes of this work a model in profile research.

The seven chapters of the volume provide a synthetic image of the Rodna Mts National Park and of human impact on the geographical space.

Chapter One analyses the *Man-environment relation within mountain areas*, and a set of introductory notions, e.g. natural park, biosphere reserve, as well as programmes for mountain environmental research; fundamental concepts: theoretical and methodological relations between physical and human geography and the role of these concepts in making prospective analyses reliable.

Chapter Two, *Rodna Mountains National Park. General considerations*, is an overview of the Park's history, location and place among protected areas in Romania, zonality, current use of land and infrastructure.

Chapter Three, titled *Natural potential, a support of man-environment relations*, expounds on problems of geology, landscape, climate, waters, soils and the biotic cover.

Chapter Four, *Population and settlements in the Rodna Mountains*, discusses aspects of human geography, perhaps a bit too sketchy.

Chapter Five dwells on matters of *Human pressure on the environment* with highlight on local toponymy, types of human pressure and assessment indexes.

Chapter Six, *Environmental dynamics*, presents major problems of land erosion, trees knocked to the ground, with focus on environmental dynamics within the context of global climate change.

The last chapter, *Natural tourism potential and ecotourism development prospects*, analyses the landscape's tourism potential, ecotourism and sustainable development changes.

In view of the work's theoretical-methodological attributes, the information provided, the original analyses, and the impressive quantity and quality of graphical material, the study is expected to arouse the interest of a wide range of specialists and students of geography and economics.

The well-documented approach and wealth of ideas make this volume a valuable reference material in problems of man-environment relations and of environmental geography.

Dragoș Baroiu

