

GENERAL JOB-EXCHANGES IN ROMANIA.
A COMPARATIVE SPATIAL ANALYSIS OF VACANCY SUPPLY AND DEMAND
BEFORE AND DURING THE CURRENT ECONOMIC – FINANCIAL CRISIS

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Key-words : job supply, job demand, current economic-financial crisis, Romania.

Les bourses générales d'emplois en Roumanie. Analyse spatiale comparative de la demande et de l'offre d'emplois pendant la crise économique-financière actuelle. Les effets de la crise économique-financière actuelle sur l'offre et la demande d'emplois enregistrées sont soulignés dans une analyse comparative (2008–2010) aux niveaux des départements sur les informations générales et les disparités territoriales de ces variables. Pendant cette crise, le nombre des agents économiques participants aux bourses générales d'emplois a enregistré une évolution négative, à cause de la restreinte des activités économiques, avec des conséquences sur la croissance du surplus de force de travail. L'offre d'emplois a enregistré une dynamique sinueuse, mais la tendance a été négative, concrétisée par le passage pendant 2008 et 2010, de la classe supérieure (2001–2500 emplois et plus de 2501 emplois) à la classe inférieure, celle de 1001–2000 emplois. Au niveau des départements, les analyses indiquent la constance spécifique pour la demande d'emplois (la classe de plus de 2500 emplois) et le déclin d'offre d'emplois, qui signifie la baisse d'emplois, généralisée dans l'économie pendant la crise économique-financière actuelle.

INTRODUCTION

General job-exchange meetings are organized once a year by all county employment agencies (local agencies and working points) for all persons of working age, irrespective of training level, ethnicity, etc. Apart from the other types of labour exchanges organized at national or county level for various occupations and categories of labour (e.g. youth, graduates, women, Roma, the over 45 year-olds people coming from the social protection system, disabled, etc.), the general job-exchange system represents the most important organized framework for face-to-face supply and demand.

County and local employment agencies identify and centralise vacancies on the basis of by the economic agents' reports (legally binding). However, employers do not report all vacancies, the number of which is seen to decrease in the agencies records as higher qualification and specialisation is required (*Analiza pieței muncii. Regiunea de Vest*, 2008). Another difficulty encountered in this study is the discontinuous data rows at county level. But for all that, a comparative analysis of general information and territorial disparities in jobs supply and demand gives an overall insight into the impact of the current economic crisis on businesses and the labour market.

The aim of the present study is to analyse jobs supply and demand in the light of the statistical figures published by NAE (National Agency for Employment) after each general job-exchange meeting. The effects of the current crisis on job supply and demand at county level have been assessed by comparing the situation of counties as it appears in the data published for the years 2008, 2009 and 2010.

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TEMPORAL AND LOCAL LANDMARKS

A general job-exchange took place in 134 localities on April 18, 2008, while in 2009 and 2010; a similar event was scheduled on the 24th of April and, respectively 23rd of April, when there were only 106 and 103 offers, respectively).

General job-exchanges are organized all over Romania, by all county agencies (inclusive of the Bucharest Municipality Agency for Employment) and in most local agencies subordinated to county agencies. In terms of territorial distribution, few rural working points have organized such meetings, basically only four (Bozovici – Caraş-Severin County, Rodna – Bistriţa-Năsăud County, Ilia –Hunedoara County, Valea Sării – Vrancea County) compared with 46 in urban working points. Among the counties that did organize general job-exchanges in urban working point would recall: Hunedoara (9 exchange points), Sibiu and Mureş (each with 4 exchange points), Harghita, Timiş, Ialomiţa and Cluj (each with 3 exchange points), Caraş-Severin, Suceava, Dâmboviţa, Brăila and Vrancea (each with 2 urban localities). In the counties of Satu Mare, Bistriţa-Năsăud, Alba, Vâlcea, Olt, Argeş, Giurgiu and Galaţi there was only one urban working point. In the south-western counties (Mehedinţi, Dolj and Gorj), in some southern counties (Teleorman and Călăraşi), in south-eastern ones (Constanţa, Tulcea and Buzău) and in Braşov County, there were no general job-exchanges, with the exception of county agencies for employment and some local agencies for employment which undertook exchange actions.

As of 2008, the number of working points in town began decreasing sharply, from 44 to 21 in 2010. Outstanding among organizers were the counties of Timiş, Caraş-Severin, Cluj, Mureş and Sibiu (Fig. 1).

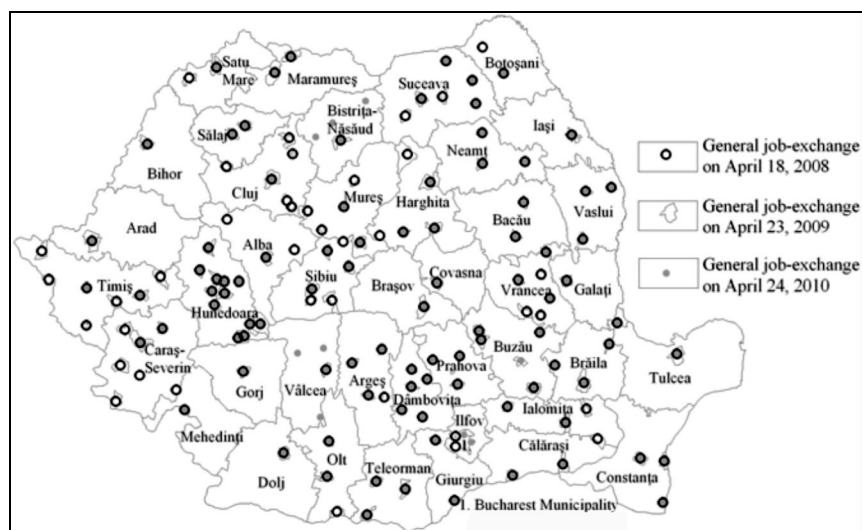


Fig. 1 – General job-exchange locations (Source: information processed from www.anofm.ro).

The reason behind this situation was the lower job-supply in the small towns and communes, where working points were in place, the reduced number of economic agents and their lower economic capacity; besides, the necessary work-force was more readily available locally than was the case in a middle town or a large city.

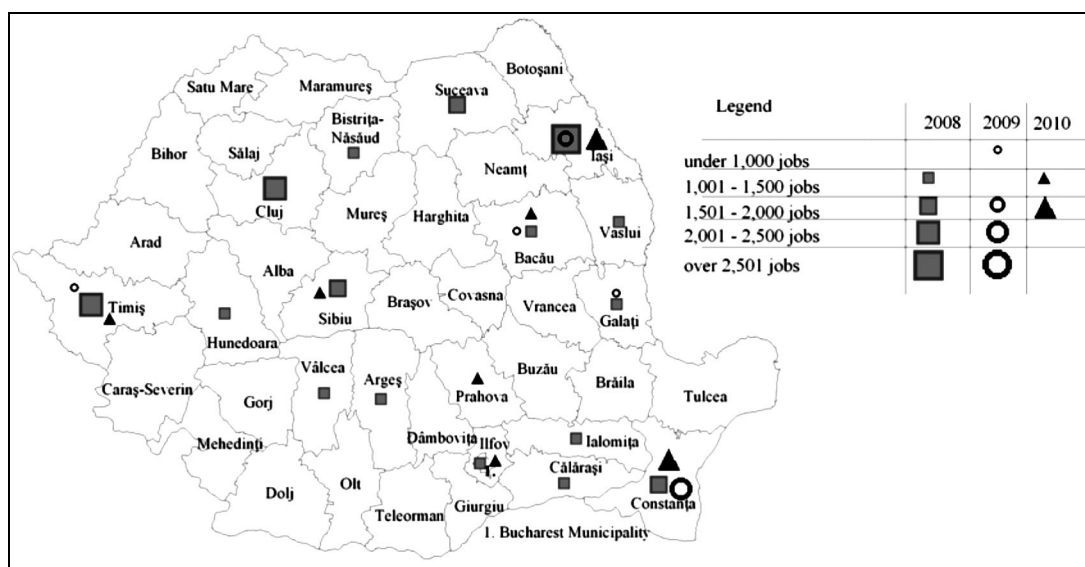
The job supply was made by the economic agents present at the meeting, but the onset of the current economic crisis suddenly diminished their number because of reduced activities, and the inevitable labour surplus. In 2008, 3,726 employers offered 54,038 jobs; in 2009, the number of prospective employers dropped by 41.9%, and although in 2010 this percentage rose by 17.9, yet it still was by 29.7% lower than in 2008.

While in the 2nd trimester 2008, 43% of Romanian companies voiced employment intentions (*Manpower Study on Labour Employment Prospects in the 2nd Trimester 2008*¹), their prognosis for the 3rd trimester 2010 was a slow-down in this respect, only 21% of employers expecting the situation to improve in the 4th trimester 2010 (*Manpower Study on Labour Employment Prospects in the 3rd Trimester 2010*²).

The fact that the average number of jobs supplied by exchanges/participants employer has been decreasing (14.5% in 2008, 12.1% in 2009 and 11.6% at present) is quite relevant of the negative impact of the crisis on the economic milieu.

Speaking in quantitative terms, job supply showed a sinuous evolution over the three study years, with a downward trend during the economic crisis: 2008–2009 registered a 51.5% decrease followed by a slight increase (14%) between 2009 and 2010, yet the overall diminution was of 44% (2008–2009).

The National Agency for Employment published county only partial data and only for counties in which job supply crossed certain thresholds that varied by the year. Therefore, the job supply territorial distribution picture of at the general job-exchange meetings is incomplete. However, a supply decrease is noticeable from job classes of 2,001–2,500 to over 2,500 in 2008 to 1,001–2,000 in 2010 (Fig. 2).



(Source: information processed from www.anofim.ro)

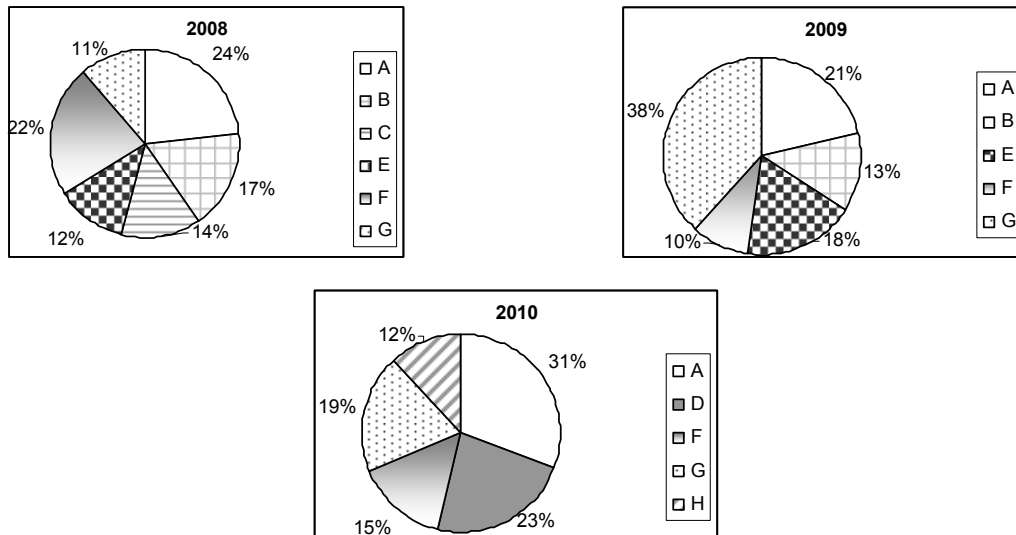
Fig. 2 – The territorial distribution of most job supplies (referred only to over 1,000 jobs in 2008, over 800 in 2009 and over 1,000 in 2010).

In point of structure, the National Agency for Employment-published-data base reveals a distinct job supply by main economic branches, yet only those branches that have the highest employment record are listed, basically those branches that boast a good correlation between supply and demand, people being employed right away. According to our three-year findings, high on the list were agriculture and auxiliary services, retail trade and tourism, with an up going supply for 2008, 2009 and 2010 (double in the retail trade sector and by four-times higher in tourism). This situation suggests seasonal job supply of low-skilled or unskilled labour. It is interesting to note that despite the economic crisis and the authorities affirmed intention to reduce public sector personnel, yet 12% of the

¹ *Manpower Study on Labour Employment Prospects in the 2nd Trimester 2008* was achieved by interviewing a representative sample of 841 employers in Romania.

² *Manpower Study on Labour Employment Prospects in the 3rd Trimester 2010* was achieved by interviewing a representative sample of 751 employers in Romania.

job-seekers were employed on the spot just in the public administration. Reduced supply over the years was recorded in the food, wood processing and garments industries, sectors severely affected by crisis throughout the country (Fig. 3).



(Source: information processed from www.anofm.ro)

Fig. 3 – The job structure by main economic branches employing many people on the spot.
(Legend: A – agriculture and auxiliary services, B – food industry, C – wood processing industry, D – transports, E – garment industry, F – retail trade, G – tourism, H – public administration)

Employers from the agriculture, hunting, forestry and fishing sector were most optimistic in regard of job supply for the 3rd trimester 2010, stating an up to + 21% increase of the Net Employment Forecast³ (NEF). Optimistic views held also the processing industry employers: NEF + 9%. Moderate job supply was anticipated also in the extractive industry (+ 6% NEF). Depleted employment possibilities were assumed by the representatives of four sectors (electrical power, gas and water, constructions, public administration, transport, storage and communications) who foresaw fewer jobs, especially in the first sector, the value advanced by them being – 10% (Source: *Manpower Study on Labour Employment Prospects in the 3rd Trimester 2010*).

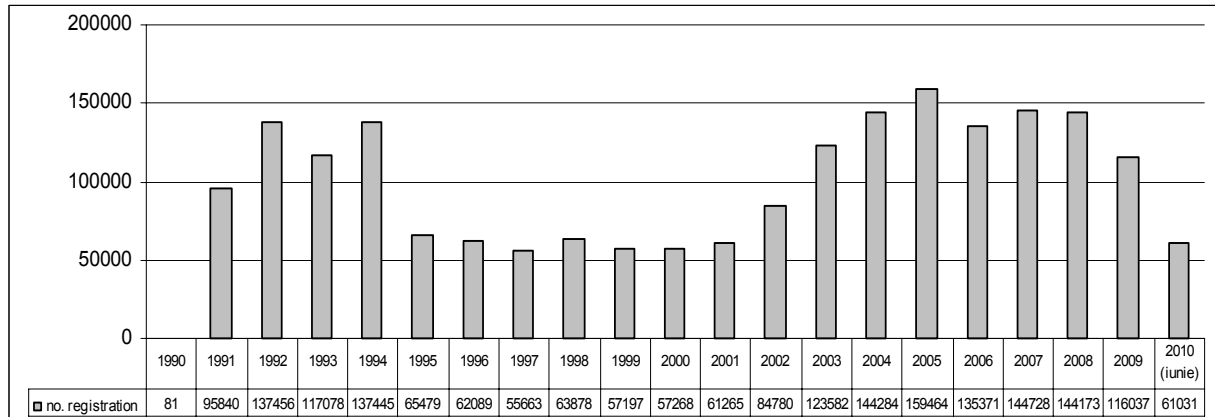
Job demand is quantified by number of participants, steadily increasing by 29.7% between 2008 and 2010. As the crisis has become ever more acute, the distribution of participants in job exchanges over 2008–2009 was fairly uneven (12.8%) compared with 2009–2010 (19.3%), when the cumulated negative effects were being felt.

More demand and less supply is directly correlating with the dynamics of new business registrations in Romania. Looking at these registrations found in the trade registers after 1990 indicates similar evolutions between the country's economic regression in the late 1990s and the present crisis situation, basically by 52.3% fewer registrations in 1994 and 1995 followed by a fluctuating interval (55,663–63,787 registrations) and a positive dynamic begun in 2002; in 2007, that is before the present crisis hit, registrations went up to 144,728 only to decrease by 19.8% in 2009 (Fig. 4).

Simultaneously with a fall in the registrations of new economic agents, there was an explosion of crossings off in trade registers their number growing by 46.6% between September 2008 and December 2009 and soaring to 84% in the first half of 2010 (Source: *Operations in the Trade Central*

³ Net Employment Forecast is obtained by the difference between the percentage of employers which anticipate a higher total employment volume and employers forecasting a fall in employment in their enterprise over the next trimester (Manpower Study on Labour Employment Prospects in the 3rd Trimester 2010).

Register. Statistical synthesis of data in the Trade Central Register on December 31, 2007, December 31, 2008, December 31, 2009 and June 30, 2010 – provisional data). It is obvious that the job supply diminished considerably, while demand was on the increase.

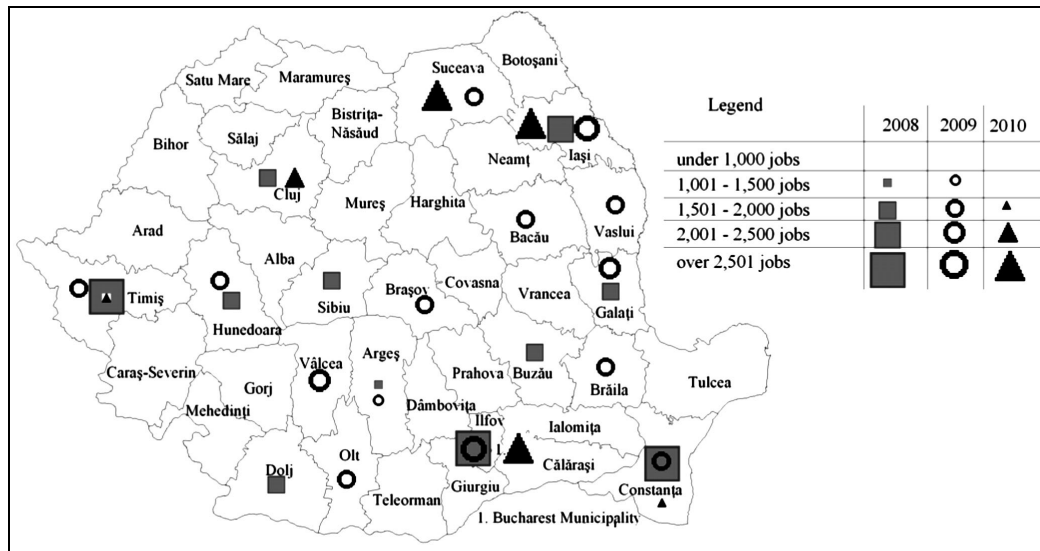


(Source: Operations in the Trade Central Register. Statistical synthesis of data in the Trade Central Register on June 30, 2010 – provisional data)

Fig. 4 – The number of registrations in trade registers and the annual structure.

Job-demand was unequally distributed at county level, with Bucharest Municipality heading the table (6,429 participants in 2008; 3,350 in 2009 and 4,000 in 2010) in the north-east, east and south-east counties (Suceava, Iași, Bacău, Vaslui, Galați and Constanța), in western counties (Timiș and Hunedoara) and in the central and southern parts of the country (Brașov; Vâlcea, Olt and Argeș).

Likewise for the supply, statistical data rows on demand are incomplete, and yet values continue to be elevated (over 2,500 employment demands) (Fig. 5). This being the result of a deficit of work-places at the general job-exchanges after the current crisis has set in.



(Source: information processed from www.anofm.ro)

Fig. 5 – The territorial distribution of most job demands (referred only to over 1,000 jobs in 2008, 2009 and over 1,500 in 2010).

THE JOB SUPPLY – DEMAND RELATION

In 2008, the general job-exchange supply topped demand (by 43,046 places). The job supply in excess to demand was characteristic of all the job-exchanges held before the onset of the present crisis. Beginning with the April 2009 meeting, the effects of the crisis situation started being felt acutely, fact that was seen in the shortage of job supply compared to demand, that is 26,259 jobs to 46,982 solicitants. With the crisis going on and unemployment rising, demand was increasing, too, (58,206 – 19.3% participants in the exchange of April 2010). In 2010, job supply increased by 14%, yet still lagging behind demand, the difference between the two growing (in absolute values: the 2009 and 2010 job deficits were 20,723 to 27,683, respectively).

RESULTS

The number of participants selected for employment was steadily rising, from 18,579 in the 2008 general job-exchange, to 24,941 in 2010. However, referred to the total number of job-seekers through the exchange system, results appear to be lower in 2010 than in 2008. The proportion of people selected for employment and of those employed on the spot per total participants in job-exchange was decreasing from 2008 to 2009, slightly reaching the 2008 value in 2010. However, a decreasing trend throughout the interval is obvious.

The main economic branches employing most people right away were agriculture and auxiliary services (increased supply), the food industry (relatively constant supply), constructions (increased supply in 2008–2009), retail trade (a twofold increase between 2008 and 2010), tourism (a four-time increase over the three years studied) and public administration.

CONCLUSIONS

General job-exchanges are being organized on an annual basis by all county agencies for employment, and partly by local agencies and working points (only in 50 working points, which are one-third of the existing ones) subordinated to the local agencies.

The number of employers present in the general job-exchanges dropped suddenly as the current economic crisis set in, because activities slowing down, there was labour surplus. The evolution of job supply over 2008–2010 was rather sinuous, notably decreasing, with supply in the 2008 job-exchange standing in the 2,001–2,500 class and over 2,501, job and falling to only 1,001–2,000 jobs in 2010.

From 2008 to 2010 there was a steady 29.7% rise in the number of participants. High values were being maintained at county level in the over 2,500 job-demand classes.

Reduced job supply and increasing demand are correlating with the numerical involution of firms founded in the trade registers and the upsurge of crossed out companies.

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UNEMPLOYMENT AND POVERTY IN THE DANUBE DELTA SETTLEMENTS. TERRITORIAL DISPARITIES

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Key-words: unemployment, poverty, restrictive area, Danube Delta.

Différenciation territoriales du chômage et de la pauvreté dans les localités du Delta du Danube. La période de transition économique que traverse la Roumanie mais surtout la déclaration du Delta du Danube comme Réserve de la Biosphère ont conduit à des changements socioéconomiques qui ont obligé les communautés, la main d'œuvre et les économies locales à une adaptation aux conditions de l'environnement.

En général, la dynamique de la population chômeuse du delta a suivi l'évolution de l'économie locale: la cessation des contrats de concession, la restructuration des entreprises industrielles de Sulina et de Tulcea, le développement des activités touristiques. Le grand nombre de chômeurs est dû, pour la plupart, aux possibilités réduites de trouver un emploi. L'offre d'emplois est limitée puisque la plupart de la population passe sa vie dans le milieu rural. L'analyse des données statistiques concernant le chômage dans le delta du Danube, selon le recensement général de la population de 2002, indique un taux du chômage de 18,6%, beaucoup plus grand que la valeur de l'indicateur pour la même année, 11,7%, au niveau du pays. Le taux du chômage reste en étroite liaison avec l'évolution de la population chômeuse. L'enquête au terrain effectuée en plusieurs localités du delta du Danube y indique une situation beaucoup plus grave du chômage par rapport à celle suggérée par la statistique officielle. L'Agence départementale d'occupation de la main d'œuvre de Tulcea essaie de spécialiser une part des habitants du delta du Danube dans des activités liées au tourisme. Mais la plupart des gens préfèrent de ne pas faire appel à l'agence et de continuer de pratiquer un travail journalier. Dû aux restrictions introduites dans la pêche, activité traditionnelle de l'endroit, les pêcheurs devront se réorienter comme profession. En ce qui concerne la pauvreté, outre que le déficit de revenus, la population locale se confronte avec le déficit de quelques conditions essentielles de vie, comme suite de quelques accumulations négatives, à savoir: accumulation de dettes, déficit d'éducation, incapacité d'intégration dans le marché du travail. Les personnes âgées à une pension réduite, ainsi que les chômeurs et les personnes qui ne bénéficient d'aucun revenu et se trouvent dans une phase avancée de la pauvreté ont peu de chances à se redresser. Sans redressement, ces groupes risquent, à l'avenir, d'être marginalisés par la société dont ils font part.

The Unemployment Law No 1/1991 stipulated the protection of jobless people and their professional reintegration, an act which, after scores of years, acknowledges the existence of unemployed in Romania. Thus, protecting this category of people appeared to be imperiously necessary in the perspective of privatizing and restructuring the industrial enterprises, of personnel lay-offs and of part of the population returning to their places of origin. In keeping with legal provisions an unemployment assistance fund was to be created, beginning with January 1, 2004, through the contribution of 3% by enterprises and 1% by the employees.

Assistance benefits are limited to six months, nine months and one year for people temporarily out of work and youths who did not find a job after school graduation. The sum depends on the net income previously obtained by the beneficiary, seniority, category in the staffing chart and payment of contribution.

In 1992, assistance benefits were to be received also by people had failed to find a job within the time-period entitled one to receiving payment. The new benefits were no longer tied to one's earnings before dismissal, but to the minimum wage/economy, which means that it was lower than the unemployment benefits, but could be allocated over a longer period of time (up to 18 months).

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In 1997, as unemployment was growing, legal regulations offered additional facilities to small- and medium-size enterprises requesting low-interest credits to create new jobs, to set up or develop new co-operative units on condition that the people employed be maintained on the job for at least three years. These facilities had in view unemployment control and labour employment. Simultaneously, the period of state subventions (70%) for the graduates' net base-pay was extended from nine to twelve months.

It is now that the lay-off through collective redundancies was to be paid. In addition to unemployment benefits, people made redundant are entitled to compensations from public funds equivalent to 6-12 average wages/economy, in terms of seniority.

The first law on social protection and professional reintegration of the unemployed was re-published in 1994, completed by the Emergency Government Ordinance 47/1997, and repealed in 2002, when they passed a new law (76/2002) on the social security systems for jobless people and employment stimulation.

Unemployment in the Danube Delta is directly connected with evolutions in the local and county economy. As enterprises slowdown their activity or closed down, the number of redundancies and the rate of unemployment have been on the increase.

The economic transition and the Danube Delta Biosphere Reserve status have entailed a number of social-economic changes, obliging local communities, the local workforce and the economy to adjust to the new conditions. The active rural population, particularly the female one, is out-of-work, or is looking for a work-place, a situation caused largely by little job opportunities since most people live in the country-side. For villagers, the majority of whom are fishermen who hold an industrial fishing licence, just as for the population at large, few jobs are on offer, e.g. only functionaries in state institutions, teachers and auxiliary staff in schools and kindergartens, many completing their revenues as day workers.

According to statistical data based on 2002 census figures, unemployment in the Danube Delta was of 18.6% by a higher than the national value (11.7%) registered that same year.

At county level, unemployment had a sinuous, generally down-sliding evolution (9.37% in December 2001 and 5.34% in April 2009), but with significant fluctuations in the Delta (a minimum of 2.17% in December 2005 and a maximum of 5.69% in December 2004). Generally, it appears that the evolution of unemployment rate was almost linear between the two temporal reference points (3.7% in 2001 and 3.3% in April 2009) (Fig. 1 a,b).

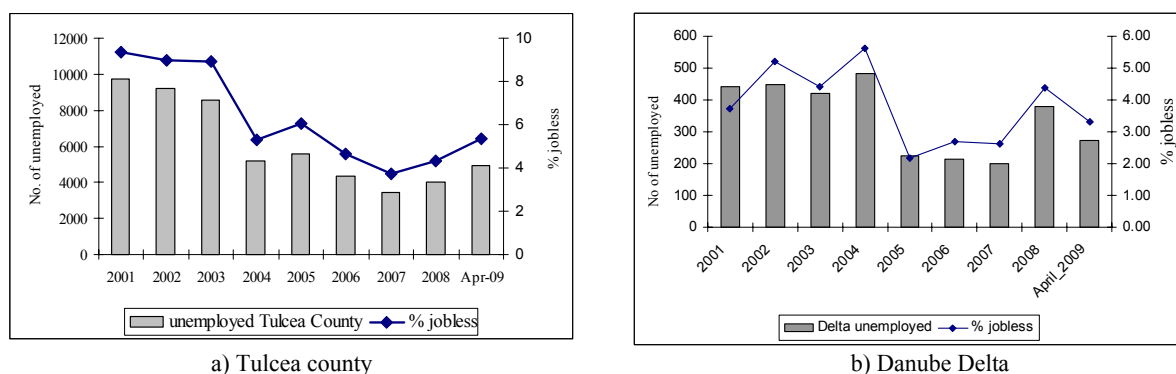


Fig. 1 – The number of unemployed and the unemployment rate.

The number of jobless people in the Delta was quite similar to that in Tulcea County, with significant decreases (by ca 50% in 2005, 2006, and 2007) and an increase in 2008. As a rule, the unemployed population dynamics in the Delta followed developments in the local economy: cancellation of leasing contracts, restructuring of industrial units in Sulina and Tulcea, and development of tourism.

Taking a look at the unemployment rate dynamics/settlement one finds it to correlate closely with the numerical evolution of the unemployed population (Fig. 2).

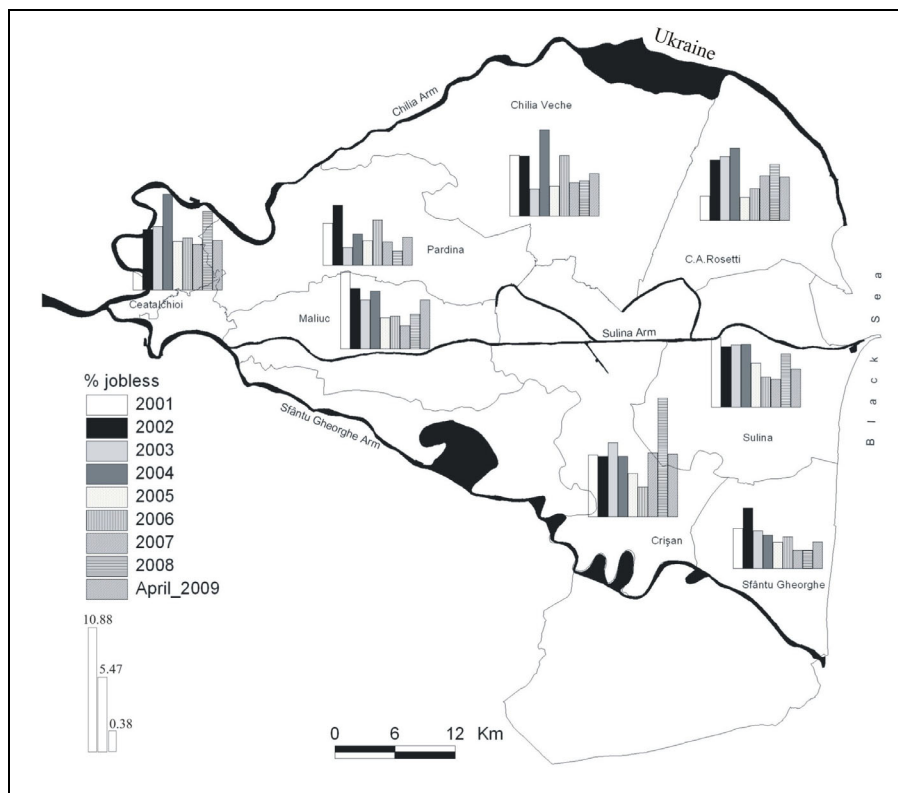


Fig. 2 – The rate of unemployment in the Danube Delta (Source: processed after TCLA).

Generally speaking, the number of jobless people in the Danube Delta showed ups and downs in terms of the economic and socio-political situation. Stimulating economic and social activities has a direct numerical impact on the jobless. After the 1990s, when unemployment was officially reported, there were more people, formerly industrial and construction workers who had no work place; on the other hand, the situation in exception making was be plan. Better in agriculture where unemployment values stood low (e.g. in Ceatalchioi and Pardina) (Fig. 3).

As repair and maintenance shipyards and some units of the food industry closed down, sectors which used to employ a large male and female workforce, the ranks of the unemployed increased, some were either looking for their first job, or trying to find another work-place. Relatively many jobless people were in Chilia Veche, where a number of farms had been dismantled; at Crișan, jobs were in short supply because of little local opportunities, on the one hand, and of the existence of a large young population aged 15–39 years, on the other. Besides, many general school-graduates remained at home because they had not the money to go on to high-schools elsewhere, while most of these who did finish higher grades returned to their native settlement but could not find a job there.

An altogether different picture offers Sfântu Gheorghe, a settlement where fishing, both in the Danube and at sea is an old traditional occupation, and a very active sector, so that few people were out-of-work. Also a large part of the female population found employment with the “Anonimul” Foundation, which ran a canteen for the poor, the tourist cottages of the vacation village, or at the fisheries station. At C.A. Rosetti, low unemployment was the result of elderly population (60–75 years old) a more numerous than the active one.

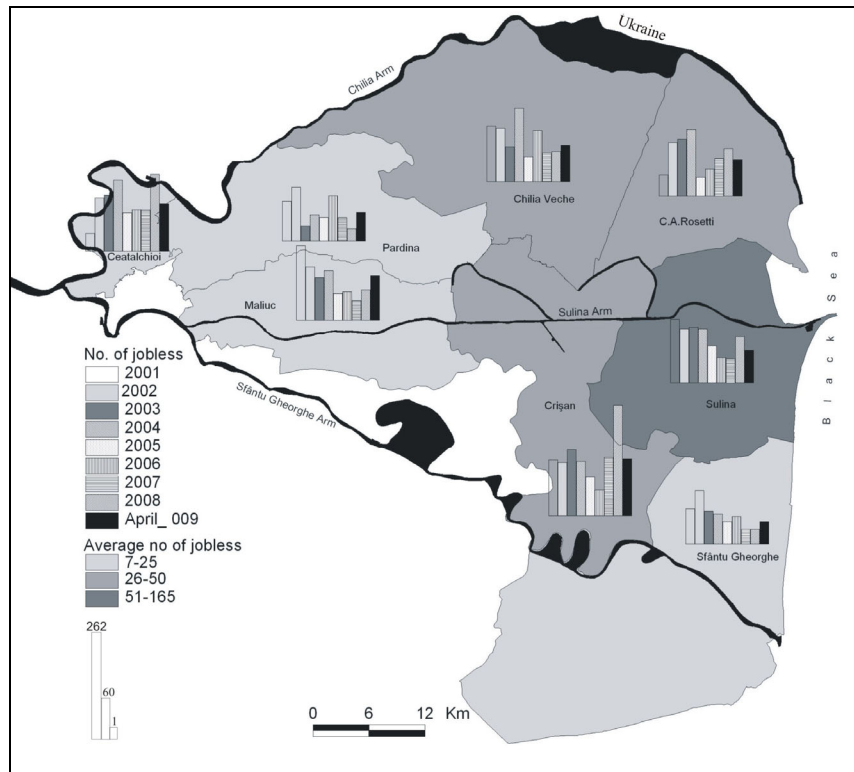


Fig. 3 – The numerical evolution of jobless people (*Source: processed after TCLA*).

Talking a look at the number of the unemployed/total population ratio, one finds a higher correlation between the overall Danube Delta inhabitants and the number of unemployed (0.7692) in 2002 than in 2008 (0.6313). The 2002 situation looks as follows: Sulina Town (215 unemployed), stood just above the correlation curve, while the localities of Chilia Veche (60), Crisân (34), and C.A. Rosetti (67) lay under the correlation curve, which means that the number of jobless people was in agreement with the hierarchical rank of these settlements in terms of overall population. The other localities stood above the curve (Maliuc – 25 unemployed, Sfântu Gheorghe – 17 and Ceatalchioi – 15 and Pardina – 16) and close to it, a position suggestive of a slightly higher unemployed population than hierarchical rank of these settlements in terms of overall population (Fig. 4a).

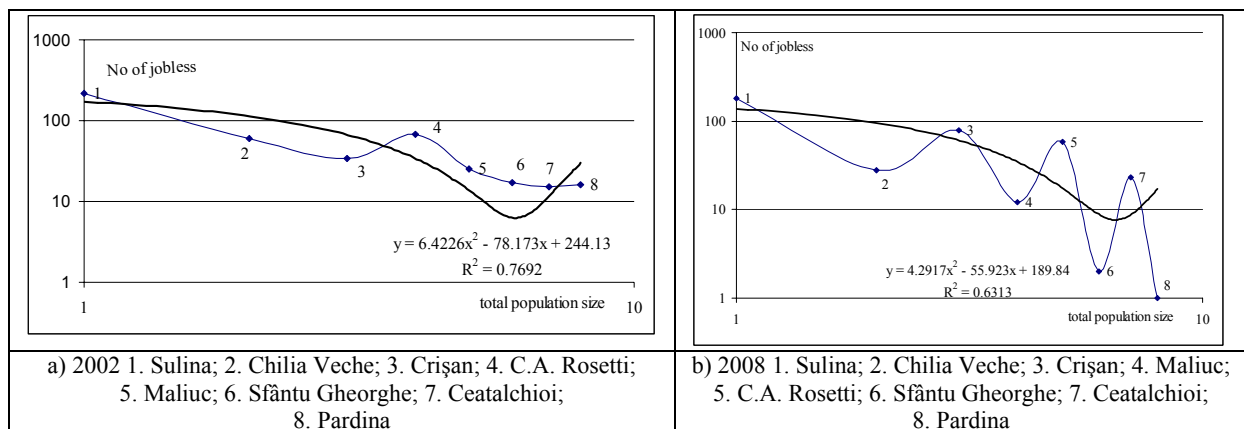


Fig. 4 – Total population/jobless people ratio.

In 2008, the situation was different, in that only two localities some close to the correlation curve (Sulina – 161 unemployed, and Crişan 70, both having had the same rank also in 2002); below the correlation curve and increasingly for from it stands Chilia Veche – 40 jobless people, Maliuc – 11, Sfântu Gheorghe – 2 and Pardina 1, which indicates fewer unemployed than their hierarchical rank in terms of total population: the position of this group of settlements is somehow different from that in 2002, when they stood above the correlation line: C.A. Rosetti – 57 people out of work and Ceatalchioi – 20, that is more unemployed population compared to their hierarchical rank (Fig. 4b).

The fact that a loose correlation between the total population and the unemployed population was registered simultaneously with a diminution of the officially reported unemployment figures in particularly important, it suggesting that unemployment population of the Delta settlements standing above the correlation curve was insignificant numerically compared to 2002 figures.

However, it should be remembered that this analysis relies on the official statistical data supplied by Tulcea Labour Employment Agency (TLEA), while field surveys revealed hidden unemployment disturbing the local job work. Yet despite a visible numerical decrease of the unemployed population through ageing, low participation in various forms of education, poor qualification or skills unrelated to job-market demand, etc. the unemployment rate indicates the alarming rise of jobless people in some of the Delta's settlements.

Evolutions in the structure of the unemployed population in terms of benefit recipients or non-recipients between 2002 and 2008 (Figs. 5, 6) show a significant increase in the population of the latter category in all of the Delta settlements, but more especially in Pardina, Ceatalchioi, C.A. Rosetti, and Maliuc, suggesting that unemployment has acquired a chronic character.

Field investigations conducted in many of these settlements have revealed a more dramatic situation than officially reported. To deal with this reality TLEA strives to train part of the Delta inhabitants to work in tourism, but most of them prefer to shun this chance and work by the day. Since fishing has been restricted, the villagers who traditionally have practiced it will have to turn the new professions.

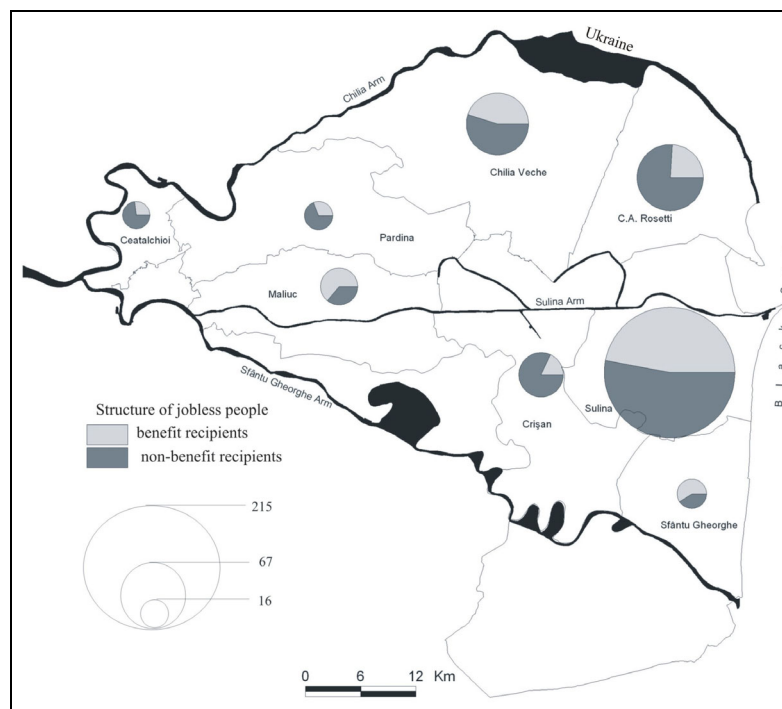


Fig. 5 – Number of benefit recipients and non-recipients in 2002.

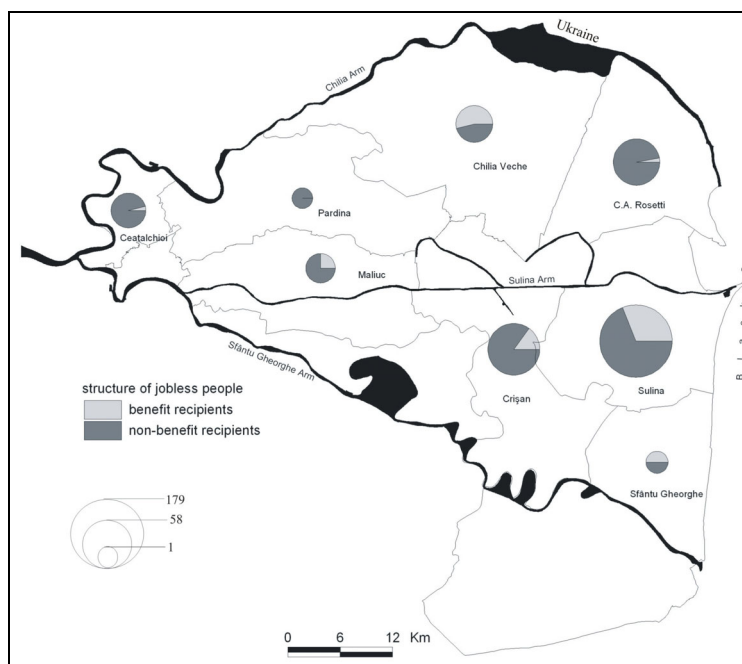


Fig. 6 – Number of benefit recipients and non-recipients in 2008.

By and large, it is clear that the shortage of jobs and of economic activities has a negative impact on the young workforce, in particular. Turning to farming is limited by land unfit for agriculture, while fishing and the number of fishermen decreases by the year. At the same time, for youths to get employment in neighboring towns is quite a problem because access is difficult, communication fares are high and the towns themselves are confronted with much unemployment and a precarious economic situation.

PROFESSIONAL RECONVERSION

As the Danube Delta has been renaturated and industrial fishing has been banned, actions have been undertaken to train fishermen (above 1,500 people) to discharge other types of activity, such as ecological tourism. Fishing is still allowed, but only for self-consumption, the surplus catch can be sold to tourist units. In order to make them turn to other occupations, the authorities have been considering the possibility to pay them compensation wages. However, most fishermen though jobless, refuse to attend the training courses offered by Tulcea County Labour Employment Agency, eventually losing the unemployed status and preferring to work illegally at various employers, or turn to poaching. For many, poaching is a source of higher income, although practicing it brings them permanently in conflict with the authorities. Appropriate training could stamp out this practice and entail the locals in tourism services, or encourage them to set up small handicraft shops for the manufacturing of reed or bulrush knit items.

TLEA-supplied data show that many inhabitants are not registered as unemployed, choosing instead to pursue subsistence farming, fishing or work illegally at various firms.

THE ROLE OF WOMEN IN SOCIETY

Looking at the role of this category of people in the past and at the present no major differences are apparent. Since fishing is exclusively a man's job, a woman's role in the household and in public is

perceived, both by herself and by others, as follows: “*women make the hard work...men are away most of the time, women being left with household chores*”: “*the husband comes home and says “here are the money, here is the fish, what is there to eat?”*” (45-year old housewife). Thus, relations between men and women are patterned on a fishing-related way of life: “*here, a man gets up at 3–4 in the morning and goes fishing, some go to the lake, others to the sea, one stays away for 3–4 days and then comes back home*” (45-year old fisherman). Therefore the woman is left alone to manage everything in the household, she knows best what should be done: “*you know, I was the manager: let us do some repair works in the kitchen, in the house, and he (the husband) would say no, it’s not necessary, but after I did what had to be done, his comment was: well done*” (68-year old housewife).

Women play an increasingly more important role, they are the ones who arrange and manage the household fit for tourist reception.

Reconsidering the socio-economic role of women is imperative in order to remove gender discrimination and marginalization of the female population which in many cases form the majority of the overall population. Acknowledging the role they play in the community creates a social and economic equilibrium, a climate of social cohesion. Yet, the extent to which the female population capable to work discharges various socio-economic activities falls short of its possibilities.

POVERTY

Poverty is a socio-cultural and psychological correlation that sets in after a lengthy period of shortage of resources; and reduces both the individual and the collective capacity for economic recovery. It affects people, families and groups of people whose material, cultural and social resources are so very limited that they are excluded from a minimum acceptable way of life in the member-state they belong to (EEC, 1985).

Extreme poverty means that financial resources are so severely missing that the individual’s living conditions are absolutely unacceptable for a civilised society, deeply affecting the dignity of the human being, causing fast-going and hardly reversible degradation of one’s normal capacities to function socially (Tompea, p. 519).

Community poverty means lack of public service or infrastructure within the respective community. A public service is said to exist if at least 80% of the population assert its availability.

The 1997 Report on Human Development defines poverty as the deprivation of all values possessed or embodied by a human being. According to the World Bank, a person is said to be poor if it has not access to a minimum set of goods needed for survival. The poverty threshold was established at 2\$/day/inhabitant, extreme poverty at 1\$/day/inhabitant.

The WHO (World Health Organization) Report considers poverty to be a multi-dimensional phenomenon which is dependent not only on one’s material situation, but also on one’s level of education, health, vulnerability and exposure to ecological and professional risk factors and on limited possibilities to make one’s needs known. Beginning with the 1990s, the poverty concept has been changing in that the individual income is no longer of primary importance, instead it is material welfare and human welfare as assessed by the Human Development Index.

In Romania, just like in the other East-European countries, the social and economic transition has entailed major changes for the population, poverty becoming more obvious as production fell and inequalities widened. A first wave of poverty occurred in the years 1991–1993, a second one came after 1997. The poverty rate soared from 22% in 1994 (*World Bank Report, 1997: Romania. Poverty and Social Policy*) to 41.2% in 1999 both in terms of percentages and severeness.

The poverty rate assessment indicators are: equivalent consumption/adult; demographic variables (size of household, age and sex structure); assets of the household members (educational level, occupation of the family head, number of employees, number of pensioners); data on the quality of the

residence (building materials, surface-area of the house, electricity, running water, sewerage system); characteristics of the residential area (size of settlement, socio-demographic traits) (Fig. 7).

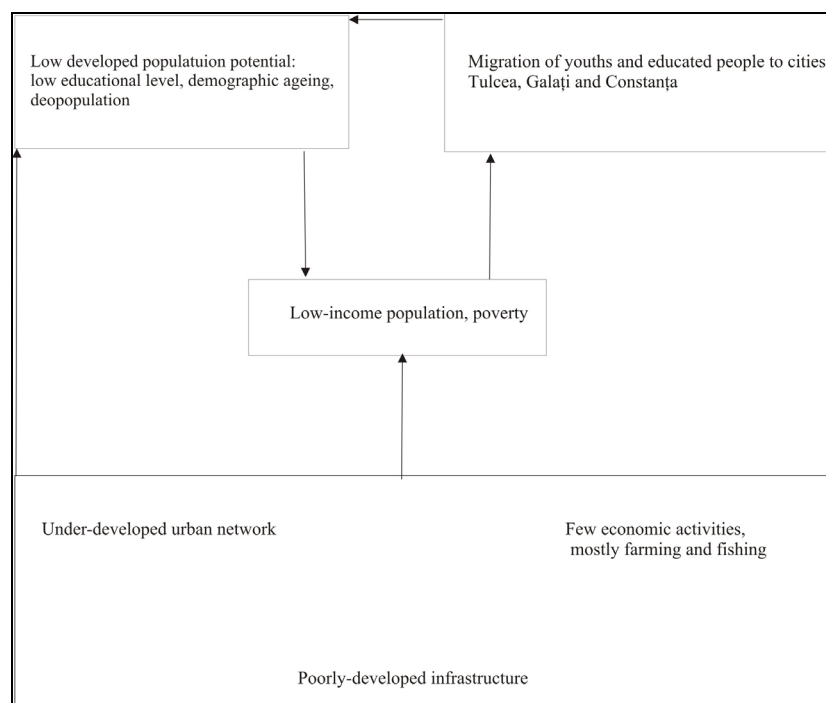


Fig. 7 – The poverty-population-economic activities-incomes relation
(Source: D. Sandu, 2000, slightly modified).

In addition to low incomes the Delta population is short of basic living conditions due to the accumulation of debts, lack of education and inability to integrate into the job market. In a state of advanced poverty and having little chances to recover are the elderly people living on a small pension, the unemployed and people without any income. Unless a solution is found, these groups are likely to be marginalized by the society they live in.

Most of the Delta inhabitants confess to being poor, very few families admitting to having a decent standard of living. The fact is that lots of people, especially women have no jobs, and moreover the population is ageing. There are actually two categories of poor people, those permanently faced with poverty, and those who, having lost their job, are temporarily in this situation. The first category includes people with disabilities, the elderly with very small pensions, without any prospects to ever obtain decent revenues, and families with many children.

The greatest part of the Delta poor perceive themselves as having been pushed into poverty by the economic transition and more recently to be the victims of leasing, whereby their “right” to benefit from fishing has been increasingly curtailed. Very few are optimistic that this crisis will soon come to an end. Poverty in this part of the country is associated with poor health and reduced life-span caused by heart diseases, improper diet, and unclean water; low incomes, little access to education, the absence of mass-media to voice people’s worries, or their viewpoints on the conservation of the Danube Delta Biosphere Reserve are also ingredients of a state of poverty.

The biggest problem in this respect is the failure of certain people to accede to the job market. Most of the poverty-stricken are children, youths and families with many children. The larger a family, the higher the risk of poverty, so lower life expectancy, and the likelihood for children to stay out of school (Pop, Voicu, 2000). A reduced level of education, makes it difficult for youngsters to find a

job, therefore their future living standard will be unsatisfactory. Most of the Delta youths cannot continue going to school beyond the primary grades, either because they fail to pass the exams, or their parents have not the means to sustain them in urban high-schools and pay housing and transport expenses. The families of old pensioners have a dramatic situation, the more so as ageing is associated with diseases and buying medicine bears heavily on their already low budget. Serious problems are facing also the one-parent family and the families of the unemployed who live on benefits from the state.

For the geographical dissemination of settlements and their welfare levels, basically of the poorest ones, see poverty map (Fig. 8). Dealing with their plight asks for investments.

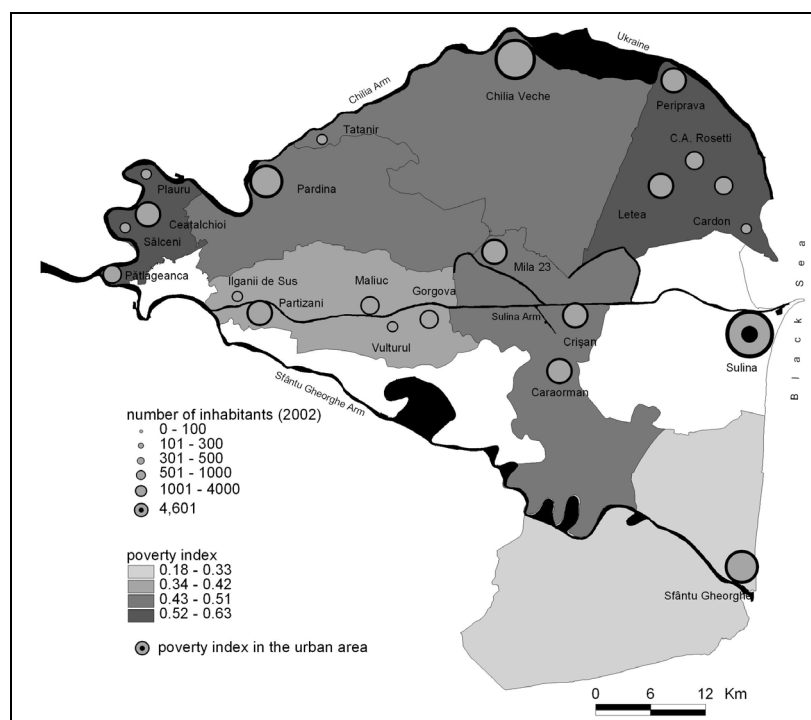


Fig. 8 – The poverty map (2004).

The population's incomes and implicitly its standard of living, of fishermen's families particular, began deteriorating after the 1990s, when Piscicola, a state-run enterprise (formed of several fishing units, forest brigades and collective farms) was divided into several private companies, a situation in which fishermen found themselves with void contracts and the loss of all former benefits stipulated therein; they had to choose between having a licensed physical person (LPP) status, or getting employment with one of the private firms. Formerly, as Piscicola employees they had enjoyed advantages, e.g. fishing-boats, equipment and tools, rest-leave and technological unemployment leave during the cold season when fishing came to a halt. However, their living standard would improve in-between the interval when Piscicola Company was dismantled and lease-holders appeared on the scene, as then they were free to fish without any imposition of quotas and sell the catch to the fisheries station that paid the best price. When the lease-holders came on the scene, fishermen had to choose between becoming their employees or maintain LPP status, work on their own and pay taxes to the state. The tax was set in terms of the estimated fish catch/year. From the moment the concessionaires began running their own contracts, the fishermen's situation would change. In most cases, they received a 50% lower price/kilogramme of fish, moreover, they had to buy the fishing tools themselves. In this way, their incomes and implicitly the living standard of their families would deteriorate significantly.

In the fishermen's view, leasing fishing resources benefited certain interest groups keen on making maximum profit, but instead of rehabilitating what had been destroyed over the 1992–2002 period and protect these resources, they embarked upon exploiting it in an irrational, uncontrolled manner.

Village women, in general, and in the Delta, in particular are one of the most vulnerable categories of population, having low incomes and few employment opportunities locally. Thus working on their own farm, or by the day in tourist boarding-houses during the summer season they do not benefit from social and health security provisions, having limited access to health-care education, contraceptive methods and information generally, which is a drawback to improving their social and economic condition.

VILLAGE DEVELOPMENT INDEX – DEVSAT

This index was conceived to identify poor villages in Romania with the help of several indicators, e.g. human capital, vital capital, dwelling conditions, the level of community, isolation (Fig. 9).

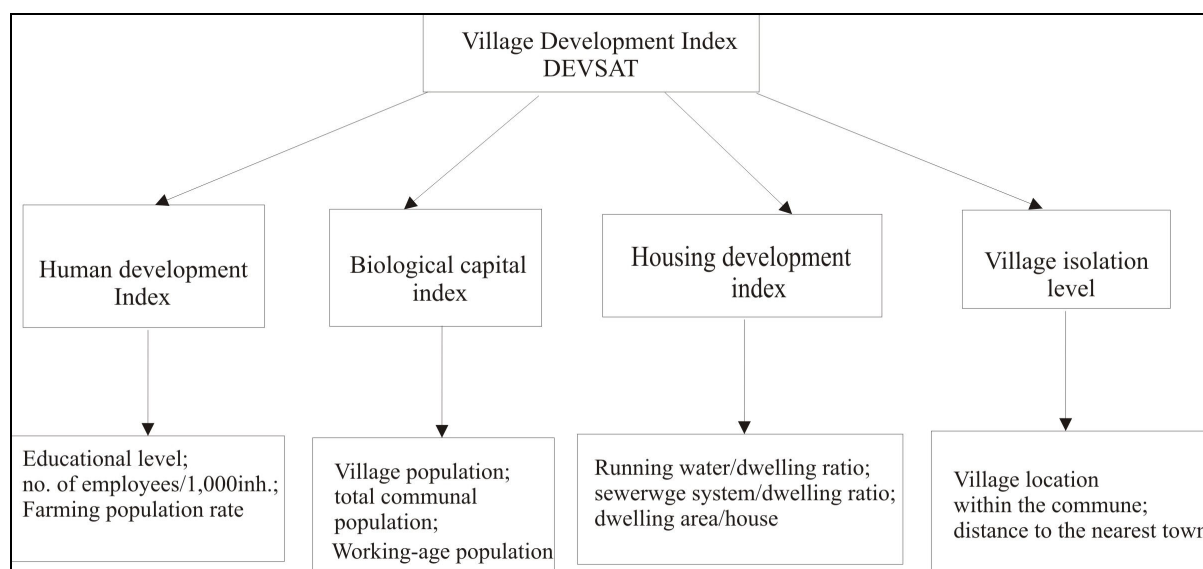


Fig. 9 – The Village Development Index. DEVSAT indicators (Source: D. Sandu, 2004).

The findings of this study have revealed a connection between the level of village isolation and its human and biological capital, in that the more isolated village location inside the commune and the greater its distance to town, the poorer and less numerous its population and the lower its educational level. At the same time, most people are working in agriculture, few of them are employed given that the working-age population group is small. House amenities are dependent on the level of education and incomes rather than on village isolation.

The results show the Danube Delta communes to be poor and lie at a great distance from county cities. Aggregating all the Danube Delta village indicators it appears that most villages (18) fall into the very poor category, two in the medium developed one – Ceatalchioi and Maliuc, and only a single village – Pardina in the poor category.

The summer of 2007, very dry and droughty, posed serious problems to the population. It came after a period devoid of precipitation since winter-time. The fires that broke out (unlike the local's

practice of burning the reed for hygienic purposes, controlled procedure) were hard to extinguish. Fortunately, the intervention of ecologists and of villagers succeeded in putting down fires close to the Caraorman Forest and settlement. However, a part of the strictly protected Erenciuc area and its older-tree reserve were destroyed by the flames. That same summer, works to remove the sand bars blocking water circulation in the Delta lakes and ponds, began first on the Sfântu Gheorghe Arm, in Dunavăț, Murighiol and Ceamurlia, which are areas of greater tourist interest. The economic development of settlements implies changing the mentality of people and of authorities alike. Hopefully, ecological reconstruction could be an additional income source beside agriculture which can satisfy only strictly individual needs.

What is essential for the Danube Delta population to exist is protection against high flood waters, the provision of the basic necessities available in the Delta and solutions to deal with isolation and communicate with the outside world.

Summing up we would say that the main problems facing the Danube Delta population are poverty, inadequate treatment of drinking water, water supply to settlements, poorly equipped dwelling-houses, deficient services and low-developed tourism.

FACILITIES FOR LOCAL RESIDENTS OR FOR PEOPLE WORKING IN THE LOCALITIES OF THE DANUBE DELTA BIOSPHERE RESERVE (ORDINANCE NO 27/13.08.1997)

Physical persons who have the domicile and actually reside in the localities listed under the Government Decisions No 323/1996 and 395/1996 benefit from a 50% reduction of local taxes for (Law No 27/1994 on taxes and dues).

The families who dwell in one of the settlements situated on the territory of the Danube Delta Biosphere Reserve benefit from 50% lower tariffs for electrical energy, natural gas, thermal power and drinking water supplied by the public network for household use, according to family quotas set by the local councils.

People are licenced to fish with own tools for family consumption without paying for the catch and in observance of regulations on fishing conditions and on permitted fishing periods /year.

Juristic persons investing in the areas benefit from deduction on the tax on profit for the costs involved by the respective investment, over a 5-year period from the start of the investment, and over a 10-year period for investors in Sulina Town.

The personnel of public institutions and of cult units appointed to posts that require higher or undergraduate specialist studies, and are situated in the localities of the Danube Delta Biosphere Reserve, as well as people occupying eligible positions benefit from an up to 60% increase of base-pay for isolation. The increase for isolation benefiting the staff of cult units is calculated to the minimum gross base-pay in this country and is paid from the budget of the State Secretariat for the Cults. When establishing the domicile in the settlement one is to work in, he/she receives an installation allowance equivalent to two base-pays. The beneficiaries of an installation allowance, who subsequently tender their resignation or are dismissed for their faults before two years from installation, will return the allowance received, under legal provisions, calculated proportional to the period left until the end of the 2-year term.

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ON THE ORIGINS AND HISTORICAL EVOLUTION OF TOPONYMY ON THE TERRITORY OF ROMANIA

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Key-words: historical development, origin of toponyms, Romania.

Der Ursprung und die historische Entwicklung der Ortsnamen auf dem Territorium Rumäniens. Beginnend mit dem Eisernen Zeitalter (La Tène), seit wann man mit Genauigkeit weiss, dass auf dem heutigen Territorium Rumäniens die Thraker wohnten, lebten hier verschiedene Bevölkerungen, die schließlich zu der Entstehung des rumänischen Volkes beigetragen haben. Dementsprechend treffen sich mehrere Kategorien von Ortsnamen, und zwar: vor-indoeuropäischen, indoeuropäischen (thrako-geto-dakischen, lateinischen, griechischen, slavischen, rumänischen und deutschen), türkischen (petschenego-kumanischen und türkisch-osmanischen) und ugro-finnischen (ungarischen) Ursprungs. Zu diesen kommen noch die jüngsten Ortsnamen hinzu, die von Wissenschaftler (buchmäßige Ortsnamen, insbesondere Regionen) oder von der Verwaltung (Siedlungsnamen) gegeben wurden. So wie man sehen kann, wurden diese Ortsnamen nicht nur von der rumänischen autochthonen Bevölkerung gegeben, sondern auch von den Bevölkerungen, die von anderen Orten hierher gekommen sind, und die diese Sprachen auf dem Territorium Rumäniens geredet haben. Man muss auch die Tatsache bemerken, dass alle Ortsnamen eine genaue Bedeutung haben, sind also übersetzbar, abhängig von ihrem Ursprung, die man in den über 5 000 Arbeiten zu finden kann, die in Rumänien und im Ausland veröffentlicht wurden.

It is precisely known that as early as the Iron Age (La Tène), the territory of present-day Romania was inhabited by the Thracians, and by other populations which eventually led to the formation of the Romanian people. Toponymy preserves specific traces of each of them. That would explain the existence of various categories of place-names: pre-Indo-European, Indo-European (Thracian-Geto-Dacian, Latin, Greek, Byzantine, Slav, Romanian and German), Turkish (Petcheneg-Cumanian and Osmali-Turkish), as well as the Finno-Ugric (Hungarian) ones. In addition, there are toponyms recently created by scientists (bookish, mostly regionyms), or by the administration (oikonyms – settlement names). It is obvious, therefore, that place-names have not been assigned by the autochthonous Romanians alone, but also by the other in-coming populations, who spoke their native languages when settling on Romanian territory. It should be remembered that toponyms have an exact meaning, so that they are translatable in terms of their origin (Conea 1960), which for some places is still unknown, or could not be found yet in those nearly 5,000 toponymic works published in Romania and abroad.

1.1. PRE-INDO-EUROPEAN TOPONYMS

These toponyms include outstanding geographical names in Romania, such as the *Danube* and the *Carpathians*. These are the legacy of the Central and East-European populations who had lived in these places during the 3rd-2nd millennia B.C., names preserved by the Thracians. Originally, they had simply been elementary terms (appellatives): *Danube* = running water, *Carpathians* = rocks, mountain. Given their antiquity, the original meaning was lost, or forgotten, being used today as proper names that have no other significance for the population.

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Linguistics (Ivănescu 1958) established the origin of the hydronym *Danube* by comparing the root *Dun-* in Romanian (*Dunăre*) with the Slavic *Dunav* and *Don* from the Thracian Donaris, the German *Donau* and with other names from Eastern Europe: *Don* in *Don*, *Danapris* in the *Dnieper*, *Danastris* in the *Dniester* and scores of other hydronyms found in Northern Caucasus and ending in *-don*: *Ghizeldon*, *Sadon*, *Haznidon*, *Urson*, *Fiadgon*, etc.

In Antiquity, the oronym *Carpathian* was used by Ptolemy (2nd century A.D.). It derives from an Illyro-Thracian (hence Dacian, too) appellative: *Karpate*, established by analogy with the present Albanian word *Karpe* = rock, with an ancient plural. The term *Karpate*, meaning mountains in general, lived with the Dacians as long as the Dacian language existed. After undergoing a process of Romanization, the Dacians would forget it and replace it with *monte* (>Rom. *munte*). The Romanian people became familiar with it only in the 19th century, being used in books, and in schools after the German cartographer Mercator (16th century) concocted the form *Carpathus Mons*.

1.2. OLD INDO-EUROPEAN TOPONYMS

These toponyms are dated approximately to the 7th–6th cc B.C., basically from the moment peoples lived within a certain territory and had a well-outlined language. The following place-names have been identified in terms of oldness and importance:

1.2.1. Thraco-Geto-Dacian toponyms come from our ancestors called Dacians by the Romans and Getae by the Greeks, both peoples belonging to the large group of the Thracians. In Book V, Chap. 3, Herodotus, the “father of history” says that they are “the most numerous and most widely spread people in the world after the Indians” (*Istoria Românilor*, I, 2001, p. 401). The Thracians populated the north-eastern part of the Balkan Peninsula, part of Central and Eastern Europe between the Azov Sea and the Dnieper in the east, the Forested Carpathians and the Beskids Mountains in the north, the middle course of the Danube up to Vienna and hence farther southwards to the Adriatic Sea in the West. Also, important enclaves lived in Asia Minor and in the Aegean Sea islands.

The existence of these toponyms is known today from Greek and Roman writings belonging to various periods of Antiquity. Some of them have lived on this day in a slightly changed form. It is the case of certain big water courses, in which the initial etymon is easily recognizable, e.g. from north to south and from east to west: *Tisa* < *Tisia*, *Someș* < *Samus*, *Criș* < *Crisia*, *Ampoi* < *Ampee*, *Mureș* < *Marisus*, *Timiș* < *Tibiscus*, *Tibisia*, *Timisis*, *Bârzava* < *Bersovia*, *Bersobia*, *Cerna* < *Dierna*, *Tierna*, *Zerna*, *Motru* < *Amutria*, *Admutrium*, *Jiu* < *Silus*, *Gilort* < *Gilpil*, *Olt* < *Aluta*, *Alutus*, *Lotru* < *Latron*, *Latris*, *Vedea* < *Ude*, *Argeș* < *Ordessos*, *Buzău* < *Muzeos*, *Buseos*, *Siret* < *Hierasus*, *Tiarantos*, *Seretos* and *Prut* < *Pyretus*, *Porota*. Some of them are recorded by Herodotus (Book IV, Chap. 49). On the other hand, the name of small watercourses has been changed, e.g. *Sargetia* to *Valea Grădiștei* or *Valea Orăștiei*.

The names of ancient localities have mostly disappeared and what recall them are stone inscriptions and Roman and Greek writings. Illustrative in this respect is *Sarmizegetusa*, the capital of the Dacian State, and a lot of *davae* (strongholds): *Argedava* (Popești), *Acidava* (Piatra Olt), *Arcidava* (Vărădia), *Berzobis* > *Berzovia*, *Buridava* (Ocelele Mari), *Cumidava* (Râșnov), *Docidava* (Șimleu Silvaniei), *Pelendava* (Craiova), *Petrodava* (Piatra Neamț), *Piroboridava* (Poiana), *Ramidava* (Drajna de Sus), *Rusidava* (Vulturești/Olt), *Sucidava* (Corabia), *Sacidava* (Miercurea Sibiului), *Tamasidava* (Răcătău de Jos), *Zargidava* (Brad-Roman), etc. Note the compound form like in German: *Hermannstadt*, *Kronstadt*, *Schäßburg*, *Karlsburg*, that is just the other-way-round than in Romanian in which word-order has been taken over from the Romans, e.g. *Civitavecchia* in Italian (Cetatea Veche in Romanian).

Only oikonyms have been preserved in a slightly altered form: *Abrud* < *Abrutus* and *Albac* < *Albakidioi* (Vraciu 1980). The great majority have been substituted for more recent toponyms of various origins related to historical conditions: *Admutrium* (*Amutria*) > *Butoiești* (Rom.), *Aizisis* > *Fârliug* (Rom.), *Ampelum* > *Zlatna* (Slavic), *Apulum* > *Alba Iulia* (Latin), *Brucla* > *Aiud* (Hung.), *Dinogetia* > *Garvăn*, *Malva* > *Reșca* (Slavic), *Potaisa* > *Turda* (Rom.), *Napoca* > *Cluj* (Rom.),

Porolissum > Moigrad (Slavic), *Germisara* > Geoagiu (Hung.), *Dierna* > Orșova (Slavic), *Drobeta* > Turnu Severin (Rom. + Slavic), *Tibiscum* > Jupa (Slavic). An ancient Thracio-Geto-Dacian toponym is also *Dacia*, also the very name of that country (*România. Atlas istorico-geografic, 1996*).

1.2.2. Latin toponyms. The Romans are known to have conquered Dacia, generally in A.D. 106, ruling it until A.D. 271, that is for about 165 years, preserving the Dacian toponymy. Just like in other parts of the Roman Empire, they did name some castra and settlements in which Latin is easily recognizable. After the invasion of migratory peoples, who usually ruled “sword-in-hand” (*Istoria Românilor, 2001, III, p. 603*), these names were lost and replaced with more recent ones: *Ad Aquae [Calidae]* (Thermal Waters) > Călan (the same toponym, a bit modified – *Aachen*, currently exists in Germany, because migratory populations had not passed through that area); *Ad Mediam* > Mehadia, *Ad Pannonios* > Teregoava, *Agnaviae* > Zăvoi, *Alburnus Maior* > Roșia Montană, *Angustia* > Brețcu, *Arutela* > Păușa (Călimănești), *Caput Bubali* > Cornățel, *Caput Stenarum* > Boița, *Castra Traiana* > Sâmbotin, *Cedonia* > Gușterița/Sibiu, *Centum Putae* > Surducu Mare, *Certiae* > Romita, *Civitas Ausdecensium* > Cetatea, *Gaganae* > Armeniș, *Gratiana* > Dunavățu de Sus, *Largiana* > Românași, *Mascliana* > Slatina-Timiș, *Micia* > Vețel, *Optatiana* > Sutoru, *Petra* > Camena, *Pons Aluti* > Ionești-Govora, *Pons Vetus* > Căineni / Olt, *Praetorium* > Copăceni, *Resculum* > Bologa, *Romula* > Reșca, *Saline* > Războieni-Cetate, *Salsovia* > Mahmudia, *Thalamonium* > Murighiol, *Troesmis* > Turcoaia, *Tropaeum Traiani* > Adamclisi, *Turris* > Turnu Măgurele, *Ulmetum* > Pantelimon, *Vicus Celeris* > Săcele, *Clementianum* > Mihail Kogălniceanu, etc.

An exception make *Ad Aquae Hercules* (Băile Herculane), *Ad Mediam* (Mehadia), *Altinum [Altina]* (Oltina), *Berzobis* (Berzovia), *Turris* (Turnu Măgurele), as well as *Castra Nuova* (Castranova officially assigned) and *Colonia Ulpia Traiana Sarmizegetusa*, the Roman capital of Dacia; *Sarmizegetusa*, of Dacian origin, continues to exist in books, having been given by the Romanian authorities after the Unification of Romania with Transylvania in 1918.

It is again the Romans who named the three provinces: *Dacia Superior (Porolissensis and Apulensis)*, *Dacia Inferior (Malvensis)*, as well as *Ad Moesiam* (today Muntenia), preserved in books and in historical atlases.

1.2.3. Greek and Byzantine toponyms. The Greeks, renowned navigators and traders, founded several cities and colonies on the shores of the Mediterranean and the Black Sea, which initially had Greek names, some currently existing in Italy, e.g. *Neapole < Neapolis* in Greek (The New City) and in Romania: *Histria*. The Greeks settled on the Black Sea coast in the 8th and 7th cc B.C., setting up the cities of *Tomis* (Constanța), *Callatis* (Mangalia), *Parthenopolis* (Jurilovea), *Histria* and *Argamum* (Sarichioi).

Later on, in the 2nd–3rd cc A.D. they founded *Halmyris* (Dunavățu de Jos), *Salsovia* (Mahmudia) and *Aegyssus* (Tulcea) in the Danube Delta and farther on, inside Dobrogea, *Axiopolis* (Cernavodă) and *Ibida* (Slava Rusă). Up to the 4th century A.D. all these city-strongholds were prosperous trading centres, their flourishing life being completely destroyed by the migratory populations, first the Visigoths, then the Slavs and finally the Bulgars (in 680). The names of these cities were all lost, but for one: *Histria*, introduced by the Romanian administration in 1928 on the proposal and insistence of the geographer Constantin Brătescu, impressed by the ruins discovered there, and who assigned Romanian names to other Dobrogean localities as well.

The same Greek origin have the hydronyms *Istros* (the Lower Danube), replaced by the Thracian term *Donaris – Dunaris* and *Pontus Euxinus*, signifying “Benevolent Sea”, the idea being to mislead sea-ferers, as to violent storms and huge waves customary of the Black Sea (*Dicționar de istorie veche a României 1976*).

1.2.4. Slavic toponyms. Beginning with the 3rd century A.D., waves of barbarian peoples began penetrating the Romanian soil, their pressure making the Roman army and administration leave Dacia (271). The first migrators were of German origin (the Visigoths and Gepides), followed in the 4th–6th

cc by Huns, Avars and Slavs, who like in other parts of Europe would plunder and destroy the network of cities, largely disorganising social and economic life. The native population had to leave the towns and retreat into the villages lying in smaller valleys wherefrom people would take temporary shelter in the forests, on the plateaus and smooth summits of the neighbouring mountains. After the danger passed they would return to their households.

As a result, most ancient toponyms, especially names of settlements, were lost for good, life-saving becoming the population's major preoccupation. However, the name of big rivers, along which people used to travel and return to their settlements on the large, smooth and fertile terraces protected from flooding, but with the groundwater at level low depth, were preserved as points of orientation (see 1.2.1.).

Of all the migratory populations, it was the Slavs who arrived beginning with A.D. 580. They were more numerous and settled down in the larger valleys, cultivating the land. Their co-habitation with the Romanized Romanian autochthons has resulted in some words of Slavic origin being introduced into the Romanian word-stock and in Romanian toponymy. Studies have revealed that cca. 8% of the Romanian words are of old Slavic origin (Macrea 1961), similarly numerous toponyms, given that the Slavs had formed the ruling elite rather a long period of time (6th–10th cc A.D.), see such words as *stăpân* (master), *jupân* (boyar, master), *cneaz* (knez), *voievod* (voievode, ruling prince), *boier* (boyar, nobleman), *vornic* (village chief, magistrate), etc.

The majority of Slavic place-names are recognisable by their suffixes, prefixes and word root. Some can be identified in the translation made by language specialists who used the historical comparative method, others represent typical toponyms (appellatives and anthroponyms).

Major old Slavic suffixes:

- ava: *Bârzava, Coșava, Dumbrava, Jidava, Lișteava, Oreava, Racova, Suceava, and Târnava*;
- ota: *Albota, Arnota, Balota, Dobrota, Gorgota, Palota, Pâncota, Probota, and Șerbota*;
- ov: *Bascov, Brașov, Bucov, Cleanov, Cricov, Drașov, Ilfov, Lișcov, Nanov, Milcov, and Snagov*;
- ova: *Brezova, Bucova, Cacova, Ciacova, Craiova, Criciova, Cucova, Darnova, Dâmbova, Dragova, Drinova, Dubova, and Tutova*;
- ovu: *Bratcovu, Bratlovu, Hrușovu, Ilovu, Milcovu, Neajlovu, Ostrovu, and Vicovu*;
- ca: *Camenca, Botorca, Beica, Cojocna, Mijarca, and Mlarișca*;
- eva: *Cornereva, and Costileva*;
- eț: *Begleț, Bistreț, Crușeț, Dalboșeț, Dieneț, Hârboveț, Pogleț, Topleț, Soloneț, and Voroneț*;
- ița: *Bistrița, Camenița, Ciulnița, Clănița, Coșevița, Dobrița, Bolvașnița, Plenița, Ialomița, Dâmbovița, Delnița, and Sornița* ;
- iva: *Clopotiva, Craiva, and Sălciva*;
- inț: *Băinț, Belinț, Beloșniț, Bogodinț, Chesinț, Covăsinț, Crinț, Lalosinț, and Nicolinț*;
- ința: *Berzița, Ghelnița, Florința, Lechința, Leorința, and Mehedința*;
- ic: *Brestelnic, Brâznic, Călnic, Căvnic, Chijic, Comarnic, Dobric, Dalnic, and Drănic*;
- in: *Bucin, Bustuchin, Cașin, Cuvin, Derin, Dobrin, Păulin, Săvârșin, and Seitin*;
- iște: *Braniște, Cănepiște, Grădiște, Săliște, and Târgoviște*;
- ăț: *Brestovăț, Bucovăț, Coșovăț, Casovăț, Cralovăț, Crușovăț, Dobrovăț, Dranovăț, Dunavăț, Gostăvăț, Holovăț, and Topolovăț*;
- ea: *Betea, Buftea, Cetea, Corpadea, Corugea, Coșlugea, Coșnea, Cungrea, Decea, Dobrogostea, Dolea, and Dracea, Drincea*;
- ia: *Bratia, Bozia, Brezoia, Crevedia, Crivadia, Dobraia, Fetindia, Gâlmeia, and Secăria*;
- ina: *Broaina, Cămpina, Cioclovina, Crivina, Dragalina, Studina, Stupina, and Sulina* ;
- ta: *Bălata, Corlata, Glâmbocata, Iarmata, Păltinata, and Vișforâta*;
- oi: *Baboi, Brezoi, Băicoi, Coroi, Ciuhoi, Lămoșoi, Totoi, Orloi, and Pitoi*;
- oaia: *Bercioaia, Brezoaia, Dăroaia, Gotcaia, Hălmoșoaia, Pârjoaia, and Priboiaia*;
- na: *Bazna, Blandiana, Cerna, Derna, Desna, Dorna, Coșna, Covasna, Crasna, Dragomirna, Drajna, Putna, and Zlatna*;

- mir: *Balomir, Dezmir, Dobromir, and Dragomir*;
- mira: *Dobromira, and Vladimira*;
- miru: *Balomiru, Costomiru, Cușmiru, Stanomiru, and Tehomiru*;
- uți: *Broscăuți, Brășăuți, Cojăuți, Păpăuți, Răcăuți, Rădăuți, Tăuți, and Vășcăuți*;

Major Slavic prefixes:

- **pre**: *Predeal, Prejba, Prejmer, Preluca, Prelipca, Prelușei, and Presaca*;
- **pri**: *Pricaz, Prigoria, Prihodiște, Prisăcani, Prislop, Priboi, Priporu, and Prival*;
- **ză**: *Zăbala, Zăbrani, Zăgriș, Zărnești, Zăpodia, Zănoaga, Zăvoi, and Zărnești*;
- **po**: *Podriga, Pocala, Pociovaliștea, Poclusa, Pojorâta, Posada, Poplaca, Pobleț, and Poșaga*.

Natural and anthropic elements: *Sibiu* „Râul cu Corni” (River with Cornel tree); *Scorei* “Râul Repede” (Fast River); *Cernavodă* “Apa Neagră” (Black Water); *Buda* “Coliba, Căscioara” (Hut, Small House); *Satchinez* “Sat de cnezi” (Knez Village); *Starchiojd* “Chiojdul Bătrân, Vechi” (Old Chiojd) (Iordan 1963).

Anthroponyms: *Berivoi, Bogdan Vodă, Bogdana, Bogza, Bran, Dobra, Vladimiri, etc.*

1.3. ROMANIAN TOPONYMS

At the end of 10th century, the Slavs coalesced with the Romanized autochthonous majority population, so that around the year 1000 the process of the Romanian people’s ethnogenesis was concluded. At the same time, also the Romanian language was completed, maintaining an exclusively Latin grammar structure, but with numerous Slavic elements, incorporated into the dominantly Latin vocabulary beside the 161 words inherited from the Daco-Gaetae.

From these lexical elements the Romanian people has created a multitude of toponyms which, irrespective of linguistic origin, are the most numerous ones. What is characteristic of the Romanian toponyms is their being understood by all the speakers of Romanian. An exception make a few archaic terms, no longer in current use, which had been living words in the past and understood by everyone at that time.

Most of these toponyms, originally appellatives, are found in the Romanian language dictionaries, the latest and most accessible being *Dicționarul explicativ al limbii române (DEX)*, and the most comprehensive one *Dicționarul limbii române (DLR)*, 37 volumes, last issued by the Publishing House of the Romanian Academy. Other Romanian toponyms originated from names of persons – *Dicționarul onomastic românesc* by N.A. Constantinescu, Ed. Academiei, 1963 and *Dicționar al numelor de familie românești* by I. Iordan, Ed. Științifică și Enciclopedică, 1983.

Only after having looked for a toponym in these dictionaries without finding it, we may say that it is foreign, not Romanian, but although it is still necessary to consult the works of language specialists in toponomastics.

In terms of the populations who lived and / for are still living in Romania, Romanian toponyms may originate from the following word-stocks: Thracian-Gaeto-Dacian, Latin, Slavic, Turkish, Hungarian, German, Bulgarian, Serbo-Croatian, etc.

1.3.1. Toponyms from the Thracio-Geto-Dacian word-stock included in the **DEX** are abbreviated *cf. alb.* = compare with Albanian, because the historical-comparative method has proven them to be autochthonous, not found in the languages existing in the surrounding areas. Historian I. I. Russu has published several works devoted to these elements. His latest book deals with *The Ethnogenesis of the Romanians. The autochthonous Thracio-Dacian Fund and the Latin-Romanic component* (in Rom. 1981). From the list of toponyms, the following are given below: *Argeaua, Argele*, “big whole for preserving the beehive over the winter”; *Baciu, Băcia, Băceni, Băcești*, “baci, master over other shepherds”; *Balaura, Balaurul, Bălăurel, Băligoși, Balta, Balta Albă, Balta Doamnei, Balta Neagră, Balta Raței, Balta Sărată, Balta Verde, Bălteni, Bălțeanu, Bălțești, Barza, Gura Barza, Barzul, Bordei,*

Bordeele, Bordei Verde, *Brad*, Brazi, Brădet, Brădești, Brădeanu, *Brândușa*, Poiana Brândușița, *Brânzeni*, Brânzari, *Brustur*, *Brusturi*, *Brusturet*, *Bucura*, Bucureni, Bucureasa, Bucuresci, București, Bucuru, *Bunget*, Bungetu, *La Buturugă*, *Bulz*, Bulza, Bulzani, Bulzești, Bulzi, Bulzu, *Butucari*, Butucăria, Buturugari, Buturugeni, *Buza*, Buza Nedeei, Buzata, Buzeni, Buzescu, *Căciulați*, *Cătunu*, Cătuna, Cătunele, *Cârlani*, Cărlănești, Cărlăneț, *Copaci*, Copaciu, Copăceni, Curmătura Ștezii, *Curpen*, Curpeni, Curpenelu, Valea Curpenișului, Vârful Curpinesei, *Cursaru*, Cursari, Cursești, *Custura*, *Dărâmați*, *Gardu*, Pârâul Gardului, Gârdești, *Gălbează*, Gălbezeni, *Ghimpoaia*, Ghimpați, Ghimpețeni, *Ghionoiaia*, Ghionoiaica, *Goruni*, Goroana, Goronet, Goruniș, *Groapa*, Groapele, Gropile, Gropeni, *Grumăzești*, Grumăzoaia, *Grunji*, Stanca Grunjii, Grunjel, *Gușați*, Gușoieni, Gușoiu, Gușoianca, *Lespedea*, Lespezile, Lespezelu, Lespezeni, *Malu*, Malurile, Mălușel, Mălușteni, *Marele*, Muntele Mare, Mărișel, Mărăști, *Măzăreni*, Calea Măzărâchii, Măzăraru, *Măceșul*, Măceșurile, Măcișeni, *Măgura*, Măguri, Măgurele, Măgulicea, *Mânzați*, Mânzălești, Mânzătești, *Moșia*, Moșoiaia, Moșești, Moșneni, *Munună*, *Murg*, Murgești, *Pârâu*, Pârâu, Pâraiele, Pârâiești, *Rânzești*, Rânzălești, *Sâmburești*, *Spânzul*, *Stâna*, Stâna de Vale, Stânișoara, *Stânca*, Stâncești, *Strugureni*, *Strunga*, Strungari, Strungile, *Șopârteni*, Șopârlești, Șopârlița, Șopârlița, *Țapu*, Poiana Țapulului, *Țarcu*, Țărculești, *Urda*, Urdele, Urdari, Urdești, Urdeasca, *Vatra Dornei*, Vatra Moldoviței, *Viezuri*, Vieușina, Vieușianu, etc.

1.3.2. Toponyms from the Latin word-stock represent the largest and most important category since words inherited from Latin are outright dominant, representing over 20% of the current Romanian vocabulary. However, the words most commonly used in contemporary Romanian (38%) originate from French, e.g. fountain pen, note-book, pencil, train, railway station, ticket, highway, car, etc., because the respective objects did not exist in Roman Times, so they had to be borrowed from somewhere (Macrea 1961). These have not produced toponyms proper, except for some bookish regionyms, e.g. Getic *Piedmont*, *Metaliferi Mountains*, Black Sea *Continental Shelf*, Black Sea *coast*, Danube *Delta*, Făgăraș *Depression*, etc.

All appellatives from the Latin word-stock are found in **DEX** with the abbreviation– *Lat.* we have previously mentioned that a few appellatives from all word-stocks, being very old have lost their meaning in current speech, being replaced by other words. Having become archaisms, their meaning is explained only in the Romanian language dictionaries (**DEX**, **DLR**). Even nowadays one witnesses the substitution of old words of Thracio-Geto-Dacian origin for new words of Slavic origin: *grumaz* – *gât* (throat). Toponyms in this category are: *Chicui*, *Picui*, *Păcui* lui Soare etc. < *Lat. piculeus* “mountain peak or hilltop” and *runcu* < *Lat. runcus* “deforested place with pasture, fallow land”, present in various forms in some 50 toponyms throughout the country: *Runc*, *Runcu*, *Runcuri*, *Runculeț*, *Runculeu*, *Runcul Rău*, *Runcul Oilor*, *Coasta Runcului*, *Fața Runcului*, *Gura Runcului*, *Valea Runcului*, *Vârful Runcului*, *Runculețul de Jos*, etc.

– **Oronyms**: *Albele*, Dealul *Albii*, *D**. *Armăsarului*, *Bătrâna*, *Gâtul Berbecului*, *Capra*, *D. Carpeni*, *D. Cărpinei*, *Cărbunari*, *Căpățâna*, *Munții Căpățânii*, *D. Cetatea*, *Vârful Cetății*, *Cheile Albacului*, *Cheile Runcului*, *Cheile Turzii*, *Vf***. *Cireșului*, *M****. *Codru-Moma*, *Culmea Codrului*, *Creasta Pietri*, *Vf. Crucii*, *Curăturile*, *Curăta Mare*, *Curățele*, *Cucurbăta Mare*, *Cucurbăta Mică*, *Dosul Orlatului*, *Fața Mioarelor*, *Fața Mare*, *Fața Mică*, *D. Frasinului*, *Vf. Făget*, *Vf. Frumoasa*, *D. Furcii*, *D. Furcilor*, *Găina*, *Găureasa*, *Galbena*, *Gruiu*, *Gruiete*, *Gruieț*, *Grușteea*, *Gruianca*, *Gruieni*, *Muntele*, *Muntele Mare*, *Muntele Mic*, *Muntele Negru*, *Muntele de Sus*, *Capu Muntelui*, *Între Munți*, *Muncel*, *Muncelul Mare*, *Muncelul Rotund*, *Piatra Munceilor*, *Munțișorul*, *Neteda*, *Netedul*, *Paltina*, *Paltinul*, *Vf. Paltinei*, *Vf. Păltiniș*, *M. Pădurea Craiului*, *D. Pădurii*, *M. Păpușa*, *Piatra*, *La Piatră*, *După Piatră*, *Sub Piatră*, *Piatra Bulbucului*, *Piatra Cântătoare*, *Piatra Craiului*, *Piatra Neagră*, *Piatra Albă*, *Piatra Galbenă*, *Piatra Tăiată*, *Pietrosul*, *Pietriceana*, *Pietrișu*, *Vf. Plaiul*, *Plăișoru*, *Porumbelul*, *Râpa Roșie*, *Râpele*,

* D = deal (Eng. hill).

** Vf. = vârful (Eng. peak).

*** M = munte (Eng. mountain).

Rotunda, Rotundul, Sapa, Scara, Scărița, Scărișoara, D. Secătura, Vf. Secăturii, Sterpu D. Șesului, Șesul Craiului, Șesul Lupșelului, Vf. Strâmba Mare, Tomnaticul, Tomnățicel, Văratec, Vf. Văcarului, M. Văcăria Mare, Vf. Ursu, etc.

– **Hydronyms:** *Adâncă, Adâncata, Albele, Amara, Apa Caldă, Apa Lină, Apa Mare, Apa Neagră, Pârâul Auriu, Baia, Baia de Piatră, Băișoara, Băița, Boul Mare, Boul Mic, Bouleț, Boura, Căldăraru, Călușeri, Capra, Căpreasa, Căprioara, Cărbunari, Cărbunăriei, Cărbunele Negru, Casele, Cățelu, Ceptura, Cheia, Cheița, După Fântână, Fața, Fântânelele, Fântâna, Fântânele, Frumoasa, Frumușeana, Fundata, Fundături, Furçoara, Galbena, Lacul Sărat, Pietrele, Râu, Râușor, Râura, Râul Alb, Râul Bărbat, Râul Mare, Râul Mic, Râu de Mori, Râul Morii, Râul Satului, Râul Spinului, Spinoasa, Strâmbătura, Valea Albă, Valea Adâncă, Valea Astupăturii, Valea Boului, Valea Caldă, Valea Calului, Valea Caprelor, Valea Aurie, Valea Largă, Valea Lungă, Valea Mare, Valea Mică, Valea Morii, Valea Scurtă, Valea Seacă, Valea Vadului, Vadu, Vadurile, Verdea, etc.*

– **Oikonyms from the Latin word-stock** in alphabetical order (only letters A and B abbreviated are mentioned): *Adâncă, Adâncata* (3 localities), *Adunați* (4), *Afânata, Afumați* (3), *Alba* (3), *Albele, Albeni, Albi, Albina* (3), *Albinari Albiș* (2), *Albița, Aleși, Alun* (2), *Aluniș* (10), *Alunu, Alungeni, Amara* (3), *Amaru, Anina, Anini, Aninișu* (2), *Aninoasa* (6), *Apa* (2), *Apa Neagră, Apa Sărată, Apele Vii*, *Arama* (2), *Arbora, Arbore, Arborea, Argintari, Ariciu, Aricioaia, Arin, Arini* (2), *Ariniș, Arsa, Arsele, Arsură, Arsuri* (2), *Arșița* (4), *Arțari* (2), *Arțaru, Aspra* (It. Aspromonte), *Avântu* (It. Avanti), *Baia* (10): B* de Aramă, B. de Arieș, B. de Criș, B. de Fier, B. Mare, B. Nouă, B. Sprie), *Băile* (1 + 16 assoc. with determiners: B. Borșa, B. Herculane, B. Tușnad, etc.), *Băișoara, Băița* (7), *Barboși, Bărboasa, Bărbosu, Bătrâna, Bătrâni, Bătrânu, Sat Bătrân, Bălțata* (2), *Bălțați* (3), *Bou, Boura, Boureni* (3), *Broscățani, Broșteanca, Broșteni* (20), *Buciu, Buciniș* (2), *Bucium* (5), *Buciumeni* (5), *Buciumi* (3), *Butea, Buteasa, etc.* (*Dicționarul geografic al României, I*, 2008).

1.3.2. Toponyms from the Slavic word-stock. Beside Slavic toponyms proper, which the Romanians do not understand, there are a number of toponyms formed of appellatives and other words (adjectives, adverbs, etc.) belonging to the Romanian word-stock of Slavic origin. They are mentioned in **DEX** with the indicative *-sl.* and represent about 8% of the Romanian vernacular (Macrea 1961).

– **Oronyms:** *Baba, Babele, Chicera* (*Chicera* Amnașului), *Cioaca, Cracu, Dealul ...* (assoc. with numerous determiners: *Dealul Mare, D. Pleșii, etc.*), *Lunca Cibinului, Vârful Răchita, Podișul Târnavelor, Dealul Podele, Pe Podele, and Padiș.*

– **Hydronyms:** *Baba, Pârâul Babii, Bălan, Bălana, Belciugu, Bobu, Bogata, Bozu, Dumbrava, Dumbrăvița, Iezerul Mare, Iezerul Mic, Izbuș, Izvor, Izvoarele, Izvorul ...* (assoc. with numerous determiners: over 30 hydronyms throughout the country), *Ponor, Ponoară, Poiana, Valea Poienii, Poienița, Pustia, Pustiul, Răchita, Răchișeua, Racu, Pârâul Racilor, etc.*

– **Oikonyms:** *Baba, Băbuța, Băjenari, Bălaia* (3 localities), *Bălan* (2), *Bălani* (2.), *Bălanu* (2), *Bălușa, Belciug* (2), *Belciugatele* (2), *Bivolari* (2.), *Blidari* (7), *Bobu* (2.), *Bogata* (8), *Bogați, Boz* (2), *Bozieni* (4), *Bozieș* (2.), *Breb, Brebu* (8), *Bujor* (3), *Bujoru* (3), *Bujoreni* (3), *Deal, Dealu* (4), *Dealul* (and assoc. with other determiners, e.g. *Dealul Aluniș, Dealul Mare, etc.* = 8), *Dumbrava* (28), *Dumbrava ...* (assoc. with determiners: *Dumbrava Roșie* etc. = 10), *Dumbrăveni* (10), *Dumbrăvești* (3), *Dumbrăvița* (12), *Dumbrăvița ...* (assoc. with determiners *Dumbrăvița de Codru, etc.* = 6 ... *Livada* (7), *Livada* (assoc. with determiners: *Livada Beiușului, etc.* = 8), *Livadia* and *Livadea* (7), *Livezi* (6), *Livezile* (7), *Lunca* (32), *Lunca ...* (assoc. with determiners: *Lunca Ampoitei, etc.* = 45), *Luncani* (4), *Luncani* (assoc. with determiners: *Lunca de Jos, etc.* = 2.), *Luncile* (2), *Luncoara* (7), *Podari* (2), *Podeni* (10), *Podgoria* (2 *Podoleni* (4), and *Podu* (assoc. with determiners: *Podul Broșteni, etc.* = 32), *Poenari* (2), *Poiana* (35), and *Poiana* (assoc. with determiners: *Poiana Aiudului, Poiana Sibiului, etc.* = 58, *Poienari* (14), *Poienile* (9), and *Poienița* (10) etc. (*Dicționarul geografic al României, I*, 2008, **II**, 2009).

* B = baia (Eng. Baths, spa).

1.3.3. Toponyms from the Bulgarian word-stock. In A.D. 680, the Bulgars, a migratory people of Turkic origin, came from the River Volga (hence the name of Volgars later turned into Bulgars), crossed the Danube and settled in the south of the Danube. Here they founded a feudal state, assumed the language of the Slavic population living there, and ruling for some time also some Romanian provinces. This co-habitation introduced some works into Romanian, which subsequently became toponyms: *Bolovanu*, *Bolovani*, *Bolovăniș*, *Busuiocu*, *Colibași*, *Grădinari*, *Pogoanele*, *Plosca*, *Varnița*, *Zlătari*, etc.

1.3.4. Toponyms from the Serbo-Croatian word-stock. Other branches of the southern Slavs, the Serbians and the Croatians, crossed Romania (6th–7th cc) and settled in the north-western part of the Balkan Peninsula. From the contact with the Romanian population, a few words, e.g. *Târlele*, *Târlești*, *D. Târlui*, etc., were acquired, becoming toponyms later on.

1.3.5. Toponyms from the Ukrainian word-stock. Ukrainians are part of the Eastern Slavs. They settled at Romania's north-eastern border. Their language lies at the origin of several words, currently toponyms: *Bahna* (6), *Bahnele*, *Băhneni*, *Hreabăn*, *Hrebeni*, *Hulub*, *Huluba*, etc.

1.3.6. Toponyms from the Petcheneg-Cumanian word-stock. In the 10th–11th centuries, two Turkic peoples, coming also from the Asian steppes, crossed Romania and partly settled there. They were the Petchenegs and the Cumans whose main occupation was shepherding. They left us a few words that turned toponyms: *Ciobanu*, *Ciobănița*, *Ciobănoaia*, *Ciobănuș*, *Cibanu* and *Odaia* (2 localities), *Odaia* ... (assoc. with determiners: *Odaia Banului*, etc. 8), *Odăieni*, *Odăile* (7) (Giurescu 1961).

1.3.7. Toponyms from the Tartar word-stock. The big Tartar invasion, a very numerous Mongolian people, took place in 1241. After having been defeated in battles by the East-European peoples, they settled down in the steppes from the north and west of the Black Sea: Crimea, Bessarabia, Dobrogea, Bulgaria, etc. Romanian took over a few words, the toponyms *Arcan*, *Arcani*, etc.

1.3.8. Toponyms from the Osmanli Turkish word-stock. With a well-organised army, the Turks conquered Constantinople in 1453, extending their domination into the Balkan Peninsula. Despite the heroic deeds of Voivodes Mircea the Old, Vlad the Impaler and Stephen the Great, Wallachia and Moldavia had to accept Ottoman suzerainty, which lasted from the 15th century until the War of Independence in 1877–1878. As a result, the two Romanian Principalities, and after 1526 (the Battle of Mohács) Transylvania, too, had to pay tribute and suffer the influence of the many Turkish functionaries and military men sent here to make order. That would explain the presence of words of Osmanli Turkish origin in Romanian, some of them becoming place-names, e.g. *Bursuc*, *Bursucani*, *Bursuceni*, *Bursuci*, etc.

1.3.9. Toponyms from the Hungarian word-stock. In 896, the Hungarians, a Finno-Ugric people, arrived from the steppes lying north of the Caspian Sea and west of the Ural Mountains, settling in the Pannonian Plain. In the year 1000, they were Christianised under their King St Stephen whom the Pope gifted with a golden crown, as sign of power and support. In order to increase his influence in Eastern Europe, the Pope would send numerous missionaries and notaries to the Hungarian Court. They would relate about the Hungarians' deeds and history while the great many documents written in Latin would contribute to the cultural and political development of the Hungarian kingdom. By the end of the 11th century, after having emerged victorious in the battles waged against the native voivodes Gelu, Menumorut and Glad, the Hungarian kings succeeded in conquering Transylvania (inclusive of Banat, Crișana and Maramureș) and become exerting absolute rule until the 1st of December, 1918. Their over 800-year domination of this territory, a period in which the official language was Hungarian, while the autochthonous Romanian population was considered kind of tolerated, numerous Magyar words entered Romanian, becoming toponyms alongside the place-names

given by the Hungarian population and the authorities, e.g. *Acățari*, *Agriș* (8 localities), *Bocșa* (3), *Bocșitura*, *Berc*, *Hotarele*, *Meșteru*, *Ogașu*, *Orașu Nou*, *Sălașu*, *Șoimu*, *Șoimuș*, *Uricani*, *Vama Seacă*, *Vama Veche*, etc.

1.3.10. Toponyms from the German word-stock. To defend the southern and eastern borders of the kingdom and help with the economic development of Transylvania, the Hungarian kings brought in German colonists (mid-12th century), whom they named Saxons after Sachsen (Saxony), a land closer geographically, where they originated from. The Saxons founded numerous settlements, outstanding among them being the seven city strongholds (hence the German name of the province “Siebenbürgen”: *Hermannstadt* (Sibiu), *Kronstadt* (Brașov), *Schäßburg* (Sighișoara), *Mühlbach* (Sebeș), *Mediasch* (Mediaș), *Klausenburg* (Cluj) and *Bistritz* (Bistrița). Later on (1717–1718), Empress Maria Tereza would colonise other Germans, this time from Schwabenland (Swabia), the so-called Swabians, placing them in Banat and in the southern part of Crișana. In time, other German groups would be settled in Maramureș (the Tziptzers), in Bukovina and around the town of Satu Mare. Living side by side with the Romanians led to a series of German words (some of them growing into toponyms, others remaining regionalisms) being borrowed by the autochthons: *Glăjăria* (< glajă < *Glas* < glass), *Halta Unirea* (haltă < Halte < Halting Place), *Șura Mare*, *Șura Mică* (șură < Schur < Small Shed), *Țigla Mare*, *Țigla Mică* (țiglă < Ziegel < tile), etc.

1.3.11. Toponyms from the neo-Greek word-stock. After Ruling Prince Constantin Brâncoveanu was killed in Constantinople, accused of breach of faith to the High Porte, the Romanian Principalities would be ruled for 100 years (1716–1821) by Greeks from Phanar, a district in Constantinople, hence they were named Phanariotes. They would arrive accompanied by numerous Greek servants and functionaries to help them complete the mission they had been assigned to, namely, to collect taxes. During the Phanariote rule, schools in Greek were set up, and several Greek words, some of them turned toponyms, entered Romanian: *Arac*, *Araci*, *Boboc*, *Boboci* (2 localities), *Brotac*, *Drum*, *Mărgea*, *Mic*, *Spân*, etc.

1.3.12. Toponyms originating from anthroponyms are quite frequent, being traced to the name of a settlement founder, of some former owners, or village communities, who had possessed a mountain, a pasture, an agricultural terrain, etc. Depending on the initial (basic) name these toponyms have different origins: a) Romanian: *Albești*, *București*, *Moldoveanu*, *Negoiu*, *Cindrel*, and *Șureanu*; b) Slavic: *Dragomirești*, *Vlădești*, and *Vălcănești*; c) Hungarian: *Fărcășești*, *Fizești*, and *Mogoșești*; d) Petcheneg-Cumanian: *Tâncăbești*, *Tocsobeni*, *Turtabă*, *Basarabasa*, and *Basarabi*; e) Turkish: *Cioflinceni*, *Hagieni*, and *Caraiman*.

1.3.13. Ethnotoponyms originating from names of peoples:

a) Romanian: *Bulgaru*, *Bulgari*, *Comana*, *Comănești*, *Greaca*, *Greci*, *Huțani*, *Lipovanul*, *Neamțul*, *Piatra Neamț*, *Târgu Neamț*, *Bencecul German*, *Stamora Germană*, *Peceneaga*, *Pecinegul*, *Pecinișca*, *Rusu*, *Ruși*, *Rușii-Munți* (County Mureș), *Săsciori*, *Dealul Sasului*, *Valea Sasului*, *Secuia*, *Târgu Secuiesc*, *Sârba*, *Sârbi*, *Sârbeni*, *Tătarca*, *Cheile Tătarului*, *Tătârlăua*, *Turceni*, *Turcoia*, *Podul Turcului*, *Ungurașul*, *Ungurei*, etc.;

b) Hungarian: *Beșeneu*, *Beșenova*, *Beșimbac* (currently Olteț, Viștea Commune), *Beșinău* (currently Secășel, Ohaba Commune), *Beșineu* (Sânpaul Commune, County Mureș) < Hung. *Bessenyő* = Pecenegul; *Mintia*, *Mintiul Gherlei* < Hung. *Nemeti* = Germans, Nemți; *Crainimăt* < Hung., *Király-Nemeti* = Germans subjected directly to the kings not to the local feudal lords.

1.3.14. Hagyonyms or toponyms of religious origin. They recall the name of a saint, of a mystic revelation, or of a place considered to be sacred:

a) Romanian: *Sfântu Gheorghe* (8 localities), *Sfântu Ilie*, *Sfântu Vasile*, *Sfânta Elena*, *Sfânta Ana*, *Sângeorz* (2), *Sânnicolau* (4), *Sâniacob* (3), *Sâniob* (1), *Sânmihaiu* (6), *Sânnicoară* (2), *Sânpetru* (2), *Sânpetru* (assoc. with determiners = 6), *Sântămăria* (4), *Sântioana* (3), and *Sântion*;

b) Hungarian: *Sânbenedic*, *Sâncrai* (10 localities), *Sândominic*, *Sânmartin* (6), *Sânărăghita* (2), *Sânmiclăuș* (3), *Sânpaul* (4), *Sânsimion* (2), *Sântana* (3), *Sântimbru* < Hung. Szent Imre “Emerik” (3).

1.3.15. Toponyms recently assigned by the administration. Several settlements have officially been given new names to bestow a mark of honour on some historical, scientific and cultural personalities: *Nicolae Bălcescu*, *Tudor Vladimirescu*, *Mihai Viteazul*, *Avram Iancu*, *Cuza Vodă*, *C. A. Rosetti*, *Axente Sever*, *Mihail Kogălniceanu*, *Aurel Vlaicu*, *Traian Vuia*, *George Coșbuc*, *George Enescu*, *Ciprian Porumbescu*, *Constantin Daicovicu*, etc.

However, some less politicised names, e.g. *Oțelu Roșu* in Caraș-Severin County and Victoria Town in Brașov County, have been preserved.

1.4. NEW SLAVIC TOPONYMS

1.4.1. Toponyms of Bulgarian origin. Apart from the words that had entered the Romanian language, there are a few Bulgarian toponyms not really understood by all Romanian speakers. Part of them originate from the Bulgarian population which had arrived from south of the Danube and settled in this territory during various historical periods. Thus, in older times (8th–9th cc), some Bulgar groups (later on mingled with the native population) were named *șchei*, hence the toponyms *Șchei* (a district in Brașov City and the *Șchiaua* Mountain in the Șureanu Massif).

At the time of the Turkish occupation (14th–19th cc) other groups of Bulgarians crossed the River and settled definitively north of the Danube, in the Romanian Plain, where they could enjoy greater freedom. Here they founded a few villages which bear Slavonian names (from the Bulgarian spoken in the Middle Ages): *Cervenia* “Roșia” (distinct from *Crasna Roșia* = Red in Old Slavic), *Bela*, *Bila* “Alba” (distinct from *Băl* = Alb (White) in Old Slavic) etc.

In honour of the victories won by the Romanian Army in Bulgaria, the War of the Independence (1877–1878), the then Bucharest authorities assigned Bulgarian names to several localities in Romania: *Grivița* (8), *Smârdan* (7), *Plevna* (4), *Rahova* (2) and *Vidin* (1). Noteworthy, an outstanding Bulgarian toponymist, Ivan Duridanov, overlooking the historical event, affirmed that all these localities were Bulgarian, wondering how many Bulgarians live in Romania (Petrovici 1970). Therefore, having a good knowledge of the origin of place-names in Romania is strictly necessary in order to correctly explain the moment and significance of their appearance.

1.4.2. Toponyms of Serbo-Croatian origin. In the course of history, particularly during the Turkish occupation of Serbia and Croatia (15th–17th cc), several groups of Serbians and Croats settled north of Danube defile and in the Romanian Banat area (region lying on the fringes of the Ottoman and later of the Austro-Hungarian empires), where they enjoyed somehow greater freedom. The settlements founded by these groups of people bear typical Serbian and Croatian names: *Belobreșca*, *Divici*, *Șusca*, *Radimna*, *Pojejena*, *Liborajdea*, *Cușovița*, *Sichevița*, *Liubcova*, *Drencova*, *Svinița*, *Dubova*, *Orșova*, etc. (Suciu 1967).

1.4.3. Toponyms of Ukrainian and Lippovan-Russian origin. In the northern part of Moldavia and Transylvania, Romanians have for centuries come into direct contact with the Ukrainians, hence a series of place-names originating from this relationship: *Sălătruc*, *Bălătruc*, *Dârmoxa*, *Leadova*, *Lidvu*, etc. (Idu 2000). At the same time, several Ukrainians (named Haholi) and Russian Orthodox believers (named

Lippovans), persecuted by the Tzarist regime for religious considerations, would emigrate (18th cent.) and settle down in the Danube Delta area, on the banks of the Razim and Sinoie lakes, and on the Babadag Plateau. Their settlements were given Ukrainian and Russian names: *Pardina*, *Periprava*, *Sfiștovca*, *Letea*, *Cardon*, *Maliuc*, *Gorgova*, *Uzlina*, *Jurilovca*, *Slava Rusă*, *Slava Cercheză*, *Ciucurova*, Island *Sahalin*, Lakes *Isacov*, *Obretinul Mare* and *Obretinul Mic*, canals *Litcov* and *Lopatna*, etc.

1.5. OLD TURKISH TOPONYMS

1.5.1. Toponyms of Petcheneg – Cumanian origin. Toponyms found especially in the low steppe and pre-steppe areas from the south and east of Romania are a clear proof that the Petchenegs and the Cumans (who spoke the same language) did not rule only “on horseback” as the saying went, but settled down, mostly close to running waters and lakes, naming them with words from their own language. Subsequently they would mix up with the Romanians, leaving a relatively rich toponymy, still in use today. Toponyms referring in principal to waters being suffixed in *-l (ui)*, are found in the Danube Plain and Floodplain, in Oltenia and Muntenia up to Moldavia: *Bahlui*, *Călmățui*, *Călu*, *Desănțui*, *Gălățui* *Gearmatalui*, *Teslui*, *Urlui*, and *Vashui*, far more numerous in the past (Conea, Donat, 1958). Besides, there are also some oronyms, e.g. the *Bărăgan*, *Buceag* and *Burnaz* Plains (Ali Ekrem, 1994 cited by Nicolae, Suditu, 2008), as well as the *Covurlui* Plateau (Ungureanu, Boamfă, 2006), some of them being considered also hydronyms or oiconyms.

1.5.2. Toponyms of Osmanli-Turkish and Tartar origin. The over 400 years of Ottoman domination in the Romanian Countries has obviously left important traces in toponymy, moreover so, as Dobrogea was ruled and populated until 1878 by a majority Turkish-Tartar people. Therefore, the most numerous Osmanli-Turkish toponyms are currently found in the Dobrogea Plateau and the Danube Delta.

– Oronyms: *Ceatalul Ismail*, *Caraorman* (Black Forest) levee, *Teleorman* Plain (Pădurea Nebună – Mad Forest meaning full of dangers); hills: *Uzum Bair*, *Asmalar*, *Asan*, *Ozângele*, *Hagilar*, *Caradeniz*, *Alah Bair*, *Altân Tepe*, *Beștepe*, *Babadag*, the *Caraiman* Peak (anthroponym) in the Bucegi Mountains;

– Hydronyms: the valleys of *Aiorman*, *Başpunar*, *Canaraua Fetei*, *Dereaua Rahmanu*; *Teleorman* River; lakes: *Beibugeac*, *Babadag*, *Murighiol*, *Topraighiol*, *Siutghiol*, *Techirghiol*, *Agighiol*, *Sarighiol*, etc.

– Oiconyms: *Babadag*, formerly *Baba Salta* (the name of a great Turkish feudal lord), *Caraorman* (named in honour of Sultan Mahmud the 5th), *Medgidia* (<Sultan Medged), *Sarinasuf*, *Sarichioi*, *Nazarcea*, *Osmancea*, *Adam Clisi* (Man’s Church), *Aliman*, *Murflatar*, *Cogealac*, *Tariverde*, *Rahmanu*, *Altân Tepe*, *Congaz* (Hero’s Stopper), *Tatarbunar* (Tartar’s Fountain), *Tuzla* (Salty), etc. Isolated occurrences in other regions: *Caracal* (Black Stronghold) in Oltenia, *Ada Kaleh* (Stronghold on the Island), today it is only the name of a viaduct in the Danube Gorge, etc.

1.6. FINO-UGRIC TOPONYMS

1.6.1. Toponyms of Hungarian origin. The Hungarian authorities, having effectively ruled Transylvania for several centuries, would officially give and imposed lots of toponyms, which after 1918 were taken over and adapted to Romanian and preserved to the present day. At the same time, also the Hungarian population denominated settlements or places in which it was majoritar, or in totality, denominations assumed also by the Romanian and German people who lived in their proximity.

– Oronyms: *Oaş* Mts, *Oaşa* and *Iertaş* (Fallow Land) peaks, *Lăpuş* Mts. (Flat Place), *Harghita* Mts., *Mezeş* Mts. (Lowland), Mt. *Rez* (Copper), *Ardaşcheia* Peak (Wolf’s Stone), *Hagău* (Passageway), *Săcădate* (Rupture), *Surduc* (Gorge, Defile), etc.

– Hydronyms: *Arieş* (Golden River), *Sebeş* (Fast River), *Şieu* (Salt River), *Niraj* and *Miraş* (River with Birch-trees), *Cergău* (Murmuring River), *Chişveghi* (Small Valley), *Nodveghi* (Large Valley), *Chereteu* (Round Lake), *Sighiştel* (River with isles).

– Oiconyms: *Apahida* (Father's Bridge), *Asînip* (Lots of women), *Cisnădie* (Valley of Wild Boars), *Cenade* (Colt), *Căpuș*, *Căpuđ*, *Copșa Mare*, *Copșa Mică* (Copșa = Gate), *Căpâlna* (Chapel), *Căptâlan* (Cathedral), *Copand* (Vesper Bell), *Cheșcheș* (Goat), *Covaci* (Ironsmith), *Cut* (Fountain), *Șomcuta* (Fountain with Cornel-trees), *Lancrăm* (Round Coast), *Mănărade* (Hazel Wood), *Medveș* (Bear), *Nădăș* and *Nădăstia* (Willow), *Oiejdea* (Border Mark), *Poplaca* (Priest's Place), *Remetea*, *Râmeț* (Hermit, Hermitage), *Șercaia* (Serpent, Dragon), *Silivaș* (Plum area), *Teiuș* (Thorns), *Orlat* (Below the Fortress), *Oradea*, *Orăștie* (City), *Uioara* (New City), *Spătaț* (Saxons' Brook), *Veseuș* (Saxons' Twigs), *Șeușa* (Salty) (Iordan 1963).

– Anthroponyms: *Aiud* "Enyed", *Blaj* "Balász", *Alecuș* "Elekeș", *Loerintș*, *Laslea*, *Micoșlaca*, *Noșlac*, *Petrisat*, and *Vințu de Jos*.

1.7. TOPONYMS OF GERMAN ORIGIN

German colonists were brought into Transylvania by the Hungarian kings (12th–14th cc), into Banat, Crișana, Maramureș and Bucovina by the Austrian emperors (18th cent.) and around Satu Mare Town by the Magyar nobility (19th cent.). They would give German names to their settlements (some 290) and to the places encompassed by them. These names were partly taken over by the Hungarian and Romanian population and authorities.

The denomination of some of the most important localities in particular, would be changed first by the Hungarian authorities and after the 1st of December 1918, by the Romanian authorities: *Hermannstadt* > *Nagy Szeben* > *Sibiu*, *Kronstadt* > *Brasso* > *Brașov*, *Schäßburg* > *Segesvár* > *Sighișoara*, *Klausenburg* > *Kolozsvár* > *Cluj*, *Mühlbach* > *Szász Sebes* > *Sebeș*, *Broos* > *Szasz Város* > *Orăștie*, etc.

That would explain why some foreign authors, mainly those settled in Germany after the Second World War, used to write that the Romanian administration made massive changes in the old Transylvanian names of German origin, replacing them with Romanian ones. It should be underlined that there are currently 220 official settlement names of German origin, or referring to Germans. The Romanian administration modified only 25 such names, most of them (50), having been changed by the Hungarian administration and taken over as such by the Romanians. It is worth remembering that German denominations are being preserved in Romania, whereas in Poland, the Czech Republic, Slovakia and Hungary they have been thoroughly changed. This is a strong argument to the effect that national minorities in this country are entitled to maintain their traditional denominations (Buza 1999).

In terms of the oldness of German settlements, of the colonists' birth-place and of the social-historical conditions, one finds several categories of German toponyms:

a) Toponyms maintaining the German name unaltered, especially in Banat, where the Swabians arrived rather recently, after 1718: *Altringen*, *Bethausen*, *Charlottenburg*, *Eibenthal*, *Gottlob*, *Johannisfeld*, *Lenaheim*, *Liebling*, *Lindenfeld*, *Neudorf*, *Nitzkidorf*, *Steierdorf*, *Tirol*, etc.

b) Toponyms slightly modified, largely in Transylvania, but in which the original German term is easily recognisable: *Agnita* < Agnetheln, *Alțâna* < Alzenau, *Apold* < Trapold (Ms) and *Apoldu de Sus* < Großpold (Sb), *Berghin* < Berwindsdorf, *Bungard* < Baumgarten (Orchard), *Chesler* < Kessler (anthroponym), *Criț* < Kreuz (Cross), *Doștat* < Dürstatt (Dry place), *Felmer* < Felmer, *Ghirolț* < Gherolsdorf (anthroponym), *Henig* < Henningsdorf, *Mălingrav* < Malinkrog, *Meșendorf* < Meschendorf, *Moardăș* < Mardish, *Noistadt* < Neustadt, *Reciu* < Rättsch (Landslides), *Rodbav* < Rohrbach (Brook with Willows), *Rotbav* < Rothbach (Red Brook), *Seligștat* < Seligstadt (Happy Place), *Șelimbăr* < Schellenberg (Schell's Hill), *Șoala* < Schaalbach, *Șona* < Schönau (Beautiful River Meadow), *Șpring* < Spring (Spring), *Târpiu* < Treppen (Stairway), *Tătârlaua* < Taterloch (Tartar's Dan), *Vărd* < Werdt, etc. (Scheiner, 1926).

c) Toponyms very much modified because of their antiquity. This is the case exclusively in Transylvania, where Saxon colonists had arrived after the year 1150, speaking several mediaeval

German dialects, one of which is being preserved now only in Luxembourg. Despite having suffered alterations along Hungarian lines for 800 years, the basic German word is still detectable: *Apoș* < Abtsdorf (Abbot's Village), *Ațel* < Hetzelsdorf, *Bruiu* < Brunnweiler (Fountain's Hamlet), *Calbor* < Kaltborn (Cold Fountain), *Cașoț* < Kastenholtz (Oak Forest), *Chirpăr* < Kirchberg (Fortress Hill), *Cincu* < Schenke (The Pub), *Cloașterf* < Klosterdorf (Monastery's Village), *Cobor* < Kaltborn (Cold Fountain), *Crizbav* < Krebsbach (Crayfish Valley), *Feldern* < Felder (Fields), *Fișer* < Schweiser (The Welder), *Fofeldea* < Hochfeld (Upper Field), *Gerdeal* < Gertrudental (Gertrude's Valley), *Ghimbav* < Weidenbach (Willows' Brook), *Ghirbom* < Birnbaum (Pear), *Hamba* < Hahnbach (Cock's Brook), *Hosman* < Holzmengen (Wood Pile), *Ilimbav* < Eulenbach (Owl's Brook), *Lechința* < Leckendorf (Dry Village), *Merghindeal* < Mergenthal (Marly Valley), *Mighindoala* < Engelthal (Narrow Valley), *Moruț* < Moritzdorf, *Nocrih* < Neukirch "(New Church)", *Ocland* < Hochland, (Tableland).

d) Toponyms of German origin translated into, or adapted to Romanian: *Albeștii Bistriței* < Weißkirch bei Bistritz, *Băgaciu* < Bogeschdorf (Ms)*, *Dealul Frumos* < Schönberg (Sb), *Domnești* < Adelsdorf (BN), *Ghinda* < Windau (BN), *Glăjăria* < Glashütte (Ms), *Jacobeni* < Jakobsdorf (Sb), *Măgheruș* < Maniersch (Ms), *Noul* < Neudorf (Sb), *Noul Săsesc* < Neudorf (Sb), *Movile* < Hundertbücheln (Bv), *Petiș* < Petersdorf (Sb), *Petrești* < Petersdorf (Ab), *Petrești* < Petrifeld (SM), *Petriș* < Petersdorf (BN), *Roșia* < Rothberg (Sb), *Satu Nou* < Oberneudorf (Bv), *Sâniacob* < Jakobsdorf (BN), *Sânpetru* < Petersberg (Bv), *Sântioana* < Johannisdorf (Bv), *Șomartin* < Martinsberg (Sb), *Șura Mare* < Großscheuern (Sb), *Șura Mică* < Kleinscheuern (Sb), *Valea Lungă* < Langental (Sb), *Vulcan* < Wolkendorf (Bv). We consider them translations because the first documentary attestations were in German (Suciu 1967, 1968, Wagner 1977).

CONCLUSIONS

Toponymy is part of the spiritual heritage of the Romanian people and of the national minorities, adding information to the description and presentation of a region. Many denominations are a plastic representation of various qualities of a place, others highlight the Romanian people's antiquity and continuity on his ancestral land, basically the Carpathian – Danubian – Pontic (Black Sea) space. The reality clearly refutes the immigration theory whereby the Romanians had come from south of the Danube, beginning to "infiltrate" themselves into Transylvania since the 14th century, that is after the Hungarians, the Saxons and the Swabians had settled there. Local toponymy shows the name of some main rivers to be of Daco-Getae origin, having been preserved orally to this very day, e.g. the *Danube*, *Mureș*, *Olt*, *Criș*, *Ampoi*, *Timiș*, etc. and taken over in a very similar form by the Hungarian and German populations arrived in Transylvania after the 11th–12th centuries. Besides, there are the old Slavic names of some rivers, dating to the 7th–8th cc A.D., which the new conquerors adapted or replaced.

Detailed field investigations and the study of numerous published works (partially listed in the Bibliography) help Romanian geographers to elaborate a diversity of toponymic maps on a wide range of aspects (Oancea 1976, 1984). These maps may cover the whole Romanian territory, a historical province alone, a county, a commune or a village, as well as a certain physico-geographical region, such as a massif, a plain, a depression, etc. Like maps, which other specialists (linguists, historians and ethnogeographers) are sporadically producing, would represent the contribution of geographers to the knowledge of Romanian toponymy.

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* Parentheses represent the respective county.

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ANTHROPOGENIC CHANGES ON LANDFORMS IN THE UPPER AND MIDDLE SECTORS OF STREI BASIN

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Key words: man – as morphological agent, bad-lands, excavation morphology, accumulation morphology, hydropower facilities, anthropogenic landform map, upper and middle sectors of Strei basin.

Modifications anthropiques sur le relief dans le bassin supérieur et moyen du Strei. Les interventions anthropiques sur les formes de relief sont variées et, plus souvent, se sont prouvées nécessaires, résultant d'une évaluation équitable de chaque partie du territoire et une utilisation en conformité avec le contexte historique, culturel, socio-économique et technologique. L'évaluation efficace des interventions anthropiques sur les formes de relief est obtenue dans une étude systématique en tenant compte du contexte socio-économique, l'instabilité géomorphologique créée ou existante et les mesures d'améliorations prises. Pour illustrer les types d'intervention anthropique sur les formes de relief des cartes avec les formes de relief anthropiques ont été dressées pour deux périodes distinctes, qui ont permis également une évaluation de l'extension et de la durabilité des formes anthropiques.

1. INTRODUCTION

In the international literature, man's intervention on the environment, and consequently on the relief, has been analysed by several authors, such as: Pecsí 1974; Nir 1983; Verstappen 1983; Toy and Hardey 1989; Piacente 1996 in Panizza 1996; Billi and Rinaldi 1997; Goudie 2001, etc. In Romania, Bălțeanu 1984; Armaș 1993; Dinu 1997; Grecu *et al.* 2001; Rădoane *et al.* 2007; Urdea *et al.* 2009; Voiculescu 2009; etc. were preoccupied by this subject.

To create certain conditions, man has changed the environment over time by cutting forests, cultivating the land, irrigating, exploiting the resources etc. Through his very complex actions, he has become an *active agent*, who transforms, directly or indirectly, the reality. On the other hand, he is a *passive morphological agent*, who assists, reacts and adapts himself to the conditions created by the natural environment. Under certain circumstances, man has proved to be a strong geomorphological agent, even more efficient than the natural processes in modelling the landforms (Billi and Rinaldi 1997). Most of his actions are unavoidable, while others are necessary. Whatever their nature, they result in the degradation of the environment (Toy and Hardey 1989), and, consequently, of the relief. However, we cannot neglect the positive aspects of these interventions.

2. METHODOLOGY

Anthropogenic changes vary in time and space that is why it is difficult to establish the intensity with which they have occurred. The questions that must be answered in such an investigation are: "What has man done/does man do?", "Why?", "When?", "How?" and "How long?" In this context, a systematic study should be carried out by addressing the historical aspects of the changes, the socio-economic context when they occurred, the geomorphological processes caused and the measures

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undertaken to improve the situation (Nir 1983; Neboit 1984; Piacente 1996 in Panizza 1996; Latocha 2009 etc.).

To answer the above questions, we aim:

- to use various sources of information to gain a clear picture of man-induced changes;

The sources of information used in this study are: *cartographic materials from different periods of time*, such as: Austrian maps, scale 1:28.800 (1806–1868), Austrian maps, scale: 1:200.000 (1895–1906), topographical maps, scale: 1:25.000 (1963), hydrological maps, scale 1:200.000 (1991), topographical maps, scale 1:100.000 (1996), orthophotographs (0.5 m resolution, 2005); *agropedological studies* (1976, 1983 and 2007), *environmental reports* (2006–2008), *bibliography* and *field work* conducted between 2005 and 2010. On this basis, we obtained information from the following areas: agriculture (agricultural roads, land reclamation works, buildings), forestry (forest roads, buildings), infrastructure, settlements (extending built surfaces, types of buildings), anti-erosion works, resources exploitation, hydropower facilities (canals, offtakes, culverts, dams, reservoirs, hydroelectric plants) etc.

- to establish the demographic, socio-economic, cultural and technological context when they occurred;

In this respect, the data regarding the evolution of the population and the population density suggest the pace of the changes.

- to identify the extension and the sustainability of the man-induced changes;
- to identify the geomorphological consequences and the improvement measures that were adopted.

1. RESULTS AND DISCUSSIONS

The upper and middle river basin of the Strei valley falls almost entirely within the area of the Southern Carpathians. Having a general form of a triangle, bordered to the south by the Retezat-Godeanu-Țarcu Mountains, to the west by the Poiana Ruscăi Mountains and to the north-west by the Șureanu Mountains, and with an area of 1,559 sq. km, it imposes itself as a natural entity well individualised.

The landforms from here have fallen under the incidence of the anthropogenic factor since ancient times, as it has been proved by the archaeological discoveries. These man-induced changes are diverse and we are going to analyse them taking into consideration the activities that claimed them.

Anthropogenic changes on the landforms due to human habitat expanding intensified in the communist period, when pedological, forestry, hydrological and underground resources were exploited. We should not ignore the fact that the upper and middle river basin of the Strei valley overlaps two highly humanised areas since ancient times: the Șureanu Mountains, with the Dacian and Roman traces, and the Hațegului Depression, with the former capital of the Roman colony. That is why it is necessary to stage the changes, as it follows:

1. **anthropogenic changes from ancient and medieval period**: represented by: Dacian traces, Roman traces and Medieval traces (Fig. 1);

2. **anthropogenic changes from the modern and contemporary period**: military fortifications from WWI; on the landforms with altitudes of 285–900 m, houses and buildings responding to agricultural, forestry, industrial and tourist needs, as well as infrastructure (Fig. 2). Currently, most of them have received another destination, or have been abandoned, almost disappearing from the landscape. As a result of grazing practice since ancient times, the geomorphological landscape of the studied area stores consequences of the summer grazing (e.g. Șureanu Mts).

Anthropogenic changes on landforms through land reclamation works. Land reclamation works were carried out in the communist period and aimed at fighting against soil erosion, restoring moisture deficit (irrigation) and preventing or eliminating the moisture excess from soil (course regulation, draining works).

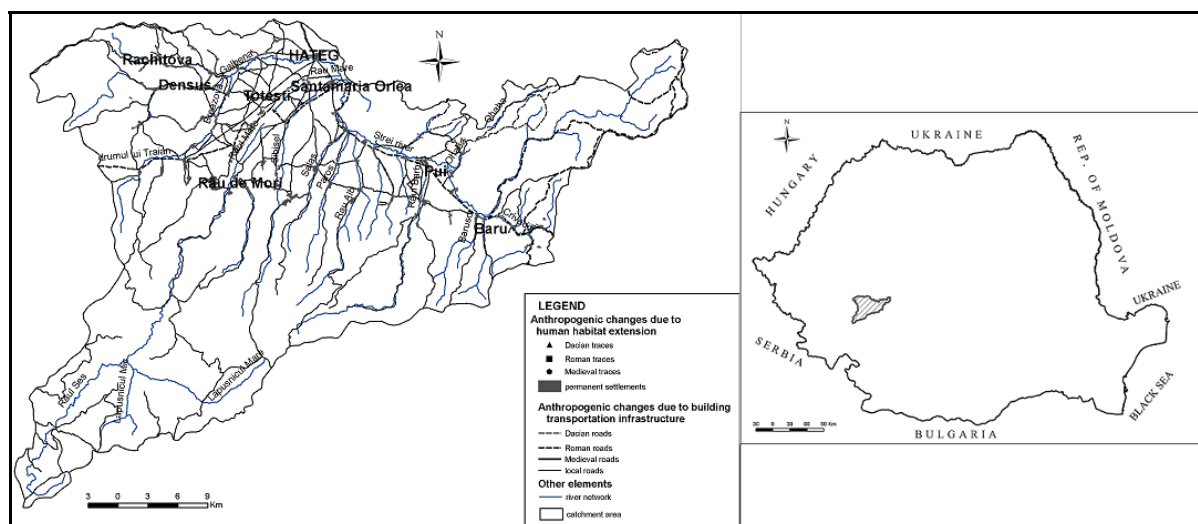


Fig. 1 – Anthropogenic landforms (up to the beginning of the 20th century).

Local irrigation systems, which extended over an area of 4,253 ha, were built between Râul de Mori, Sântămărie Orlea, Pui and Baru. *Draining works* were carried out over an area of 6,720 ha. Of this, 4,536 ha were included in the irrigation systems.

After 1991, when Law no. 18/1991 was applied, the new owners did not use the pipes or they stole them, that is why they are inexistent at present. Draining and irrigation ditches were clogged or occupied by vegetation. Floods affecting the households are more common because those ditches also had the role to collect the water from precipitation.

The most important *anti-erosion works* were performed before 1989 between Clopotiva – Sarmizegetusa – Zeicani, on the right side of the Râul Mare, on the left side of the Breazova and on the right side of the Strei (Fig. 2). These works aimed to stabilize the slopes, to prevent erosion processes, to remove water excess from microdepressional areas, to return the areas affected by landslides, pseudogleisation, erosion etc. to agricultural use.

After 1991, the anti-erosion works became unfunctional. Currently, such works are carried out by owners, depending on the financial possibilities available to them, or by land-owners associations which possess those areas and receive funds to maintain the grasslands. Among the most common anti-erosion works found on the field stand: black locust plantations, bed lining with vegetable remains resulted from cleaning pastures (Glămeia Hill, Livadia village, Baru commune), fencing the affected areas (left slope of the Râul Bărbat, Hobița village, Pui commune) etc. Unfortunately, we found that in most of the cases, no ameliorative measures are taken, and these bad-lands expand, withdrawing from the agricultural circuit these areas, for the long term.

Anthropogenic changes on the riverbeds due to regulation and embankment works. Regulation and embankment works were started after 1975 to protect settlements against floods. The works undertaken up to date are conservative and they did not disturb the initial course, but they protected it. They have ensured the stability in time of the river course in plan and of the cross section of the main channel. In the case of the sections where there are branches it was intervened with bulldozers, especially after

floods, to give the course a straight path. Also, by blocking the branches, the eyots were removed, restructuring the adjacent land. Most of the time, such works led to the widening of the channel, as a large quantity of sediments was extracted. Currently, a radical rectification should be made on the sections where the river has the tendency to loosen, by piercing meander loops.

The dams and thresholds are in an advanced stage of degradation, so they no longer fit the purpose they were built for. The most important complex regulation works were carried out on the Râul Mare. Also, regulations were made on the Strei and its tributaries.

Anthropogenic changes on the relief due to the hydropower engineering on the Râul Mare.

The works on the Râul Mare, started in 1975, had as objectives: to turn to good account the hydropower potential, to regulate channels, to remove the branches developed by the Râul Mare at its entrance in the Hațegului Depression and up to its confluence with the Strei, to drain the areas with moisture excess, to expend the irrigated areas and to provide drinking and industrial water for the settlements crossed by the Râul Mare.

The relief has been altered both on the surface and in the underground. Dams, reservoirs (Gura Apei, Ostrovu Mic, Păclișa and Hațeg), hydropower plants, two culverts, two offtakes and several tail races were built. On this occasion, it was changed not only the natural flow of the Râul Mare, but also of the Râul Bărbat, Râul Alb, Paroșu, Sălașu, as well as of some tributaries of the Râul Mare (Sibișel, Râușor), by capturing the upper courses and directing the water through an underground gallery, which is 34 km long (Fig. 2).

Anthropogenic changes due to building and expanding the transportation and technical-ediliciary infrastructure. The relief has been altered both on the surface and in the underground, by building roads, civil structures (bridges, footbridges, viaducts, retaining walls, dams, drains and tunnels), drinking water, gas and electricity distribution networks as well as sewage networks. The changes began in ancient times in the Șureanu Mountains, and were extended in the subsequent periods. Most of the roads built by the Romans are used today. For example, local road 63 overlaps “*Trajan’s road*” between Săcel- Balomir (Sântămăria Orlea commune) (Fig. 1). There are all categories of roads, located on the slopes and along valleys (Fig. 2).

In the case of highly fragmented areas, a series of bridges, viaducts and footbridges have been built and the slopes have been stabilised. Most of the civil structures have been made between Baru and Merișor, where the drainage density values are of 3.1–6 km/sq. km (Fig. 2).

During the upgrade works, even if we talk about national, local (communal) or forestry roads, material from the adjacent slopes was cut down and taken, leading to the installation of the morphological instability. The vegetation, which is a layer protection factor, has also been removed. The instability created manifests itself by erosion and mass movement processes. After upgrading the road around Gura Apei reservoir, the materials taken from the slopes moved downslope where they accumulated as debris.

Most of the roads have proved to be economically inefficient, so currently they are not functional (e.g. the railway between Subcetate and Băuțar). From the former forestry railways built in the upper river basin of the Strei for wood transportation (e.g. from the Lola and Prelucile, Tecuri valleys), their cut-and-fills are preserved after ceasing the activity in 1975.

The instability created by infrastructure implementation is manifested by erosion processes affecting in particular the unpaved roads and bare hillsides, and mass movement processes (landslides, on the railway sector between Baru and Merișor, and rock falls). The basement in the urban (Hațeg) and some rural centres (Baru, Pui, Sântămăria Orlea, Sălașu de Sus) is studded with drinking water distribution and sanitation networks.

Anthropogenic changes on the relief by natural resources exploitation. The exploitation of subsoil resources has created an excavation (quarries and mines) and accumulation (dumps) morphology. These activities have attracted a large number of workers, especially outside the catchment. This is reflected in the evolution number of the inhabitants and the population density (*e.g.* in Răchitova commune, where Boița mine functioned until 1993).

In the case of the bauxite quarry (Comarnic, Federi village, Pui commune), clay and loam sand quarries (Baru, Crivadia village, Bănița commune, Râul de Mori, Galați village, Pui commune) and granite and granodiorite quarry (the Nețișului Valley in the Râul Mare catchment), we speak about an open-cast mining. Some of these quarries were opened when the building activities at the hydropower reservoirs on the Râul Mare started in 1975 (*e.g.* Galați village, Pui commune, Râul de Mori). Others provided raw materials for local industries (the quarries from Crivadia and Baru for refractory industry from Baru) or other industries in the country (Comarnic quarry → Oradea for aluminium production) (Fig. 2).

In the case of open-cast mining, the slopes have been changed by creating 3 or 4 open-pit benches, by building access roads, staff buildings and tailings storage facilities. The slopes of the open-pit benches, as well as the dumps, are affected by surface and gully erosion and mass movements (landslides, bank failure etc.).

After ceasing the mining activities, no ameliorative works have been taken to reintroduce in the agricultural and forestry circuit these bad-land sites, although some of them are included in the environmental reports (2006–2008) as ecological perimeters (*e.g.* Comarnic quarry, Federi village, Pui commune).

After the polymetallic ore exploitation from Boița-Hațeg, the topography was modified by creating the Parani dump (3.6 ha), the Valea Luponii settling pond, on the Poni's Valley (a valley pond) (2.3 ha), by building access roads, to the coast galleries and to the pond, and the buildings which belonged to the mine.

The roads and the dump are affected by gully erosion. In the areas adjacent to the tailings, the slopes are affected by landslides, rock falls and intense erosion processes. The mine was included in the category of mining perimeters subject to greening. The pond was fenced and fixed with black locust plantations. The access is prohibited; however, the partly grassed areas are used by local people as pastures. The bare surfaces, directly affected by precipitation, are subject to gully erosion. The dump is also fixed with herbaceous and woody vegetation, so that it is barely distinguishable in the landscape.

Anthropogenic changes due to gravel quarrying. This activity takes place in the gravel pits from Baru, Livadia, Ponor, Pui, Ohaba de sub Piatră, Băiești and Ciopeia (Fig. 2). Near the gravel pits, sorting stations and aggregate deposits are located.

The gravel quarrying is practiced to unsilt, correct and rectify the course. This ensures protection to the thalweg by keeping the maximum depth of extraction at a rate that matches the thalweg of the valley. The quarrying activity is under total or partial immersion with dragline, excavator or bulldozer. Among the consequences of this activity, it is worth mentioning: widening of the minor riverbed, that can reach widths of about 200–300 m, and reducing the size of the floodplain and creating the possibility of breaking through the floodplain terraces; meander piercing and channel straightening; lowering the thalweg; increasing the quantity of sediments from bank erosion; removing the possibility of alluvial terraces formation upstream of the place of the quarrying; mass wasting (bank failure) that affects the banks; radical modification of the initial riverbed morphology by forming pools.

Between 2005–2010, when the fieldwork was carried out, it was found that both along the Strei river and its tributaries, exploitations are not always conducted, but the gravel is taken directly from the riverbed and used for immediate purposes.

To detect the extension and durability of the man-made changes, detailed geomorphological mapping was used, which proves to be a useful tool in such approaches (Latocha 2009). We made two maps with the anthropogenic landforms with origins both in the past and present human activity (Fig. 1 and 2).

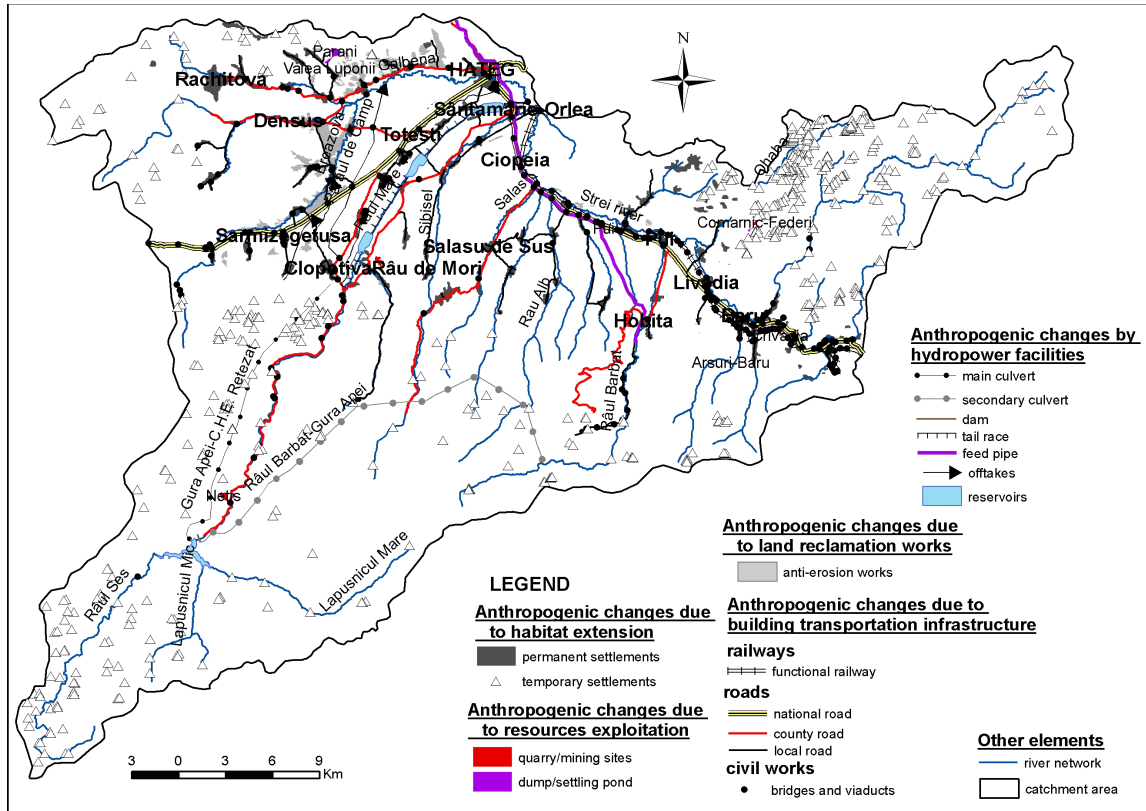


Fig. 2 – Anthropogenic landforms (at present).

4. CONCLUSIONS

By using various sources of information we outlined how the anthropogenic factor modified the landforms, the context when they were done and we detected the extension and durability of the landforms. The fieldwork, combined with the references, allowed the identification of the geomorphological consequences of the interventions, and the comparison of the present day situation with the achievements of the authorities in charge. We also identified the moments when the anthropogenic agent corrected, transformed and modified the natural processes which had affected the landforms, by intensifying or reducing their intensity and causing a rupture of certain equilibrium that nature had tried to reconstruct in different ways.

The anthropogenic changes have affected:

- floodplains and channels with the modification of the morphology and river drainage system (regulation and embankment works, gravel quarries, hydropower structures etc.);
- terraces and treads (placing the buildings, the roads, industrial activities, technical infrastructure etc.);
- interfluves (building roads, location of electric energy distribution network);
- slopes (anti-erosion works, building roads, resources exploitation, overgrazing, cattle paths);

The geomorphological processes induced by human activities are:

- *landslides* (the location of the roads and railway on the unstable slopes between Baru and Merișor, undermining the base of slopes by widening forest roads (e.g. upper course of the Strei), slipping of the dumps located in valleys);
- *bank failure* (e.g. the Strei and its tributaries in the middle basin), failure of the dump slopes (the Valea lui Ponii dump, Boița, Răchitova) and open-pit benches (quarries from Crivadia, Comarnic, Galați, Râul de Mori), of the slopes by widening the forest roads (e.g. the Râul Bărbat valley, the Râul Mare valley etc.);
- *surface erosion* (removal or lack of land cover, in particular, on dumps; overgrazing, tourist routes, cattle paths);
- *gully erosion* (overgrazing, the location of agricultural and forest roads on steep slopes);
- *rockfalls* (limestone quarries from Comarnic, Fizești, Pui, Valea Nețișului – granite and granodiorite quarry);

After performing this analysis, we suggest that the following improvement measures be taken in the future:

- course rectification by cutting meander loops and embanking the river banks on the Strei and its tributaries (the Sibișel, the Galbena, the Râul Bărbat, the Râul Alb etc.);
- anti-erosion and soil moisture correction works to reintroduce in the agricultural circuit the areas affected by moisture excess, erosion and landslides (e.g. the slopes around Săcel, Sâmpetru and Bărăștii-Hațegului villages, Sântămăria Orlea commune, Glămeia Hill, Livadia village, Baru commune, the right slope of the Strei between Ponor and Pui etc.);
- special measures implementation to stabilize and reinforce the slopes of the open-pit benches of the quarries and dumps, as they are modeled by external agents (Valea Luponii dump, Comarnic, Râul de Mori, Crivadia quarries etc.)

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CHARACTERISTICS OF THE 2007 CANICULAR SUMMER IN ROMANIA

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Key-words: extreme events, canicula, 2007 summer, Romania.

Die Merkmale der Gluthitze aus dem Sommer des Jahres 2007 in Rumänien. Mit einem kontinental-gemäßigten Klima, kennzeichnet sich Rumänien durch die Anwesenheit der vier Jahreszeiten: zwei extreme u.z. warmer Sommer, manchmal heiß, und kalter Winter, manchmal frostig, sowie zwei Übergangsjahreszeiten – der Frühling und der Herbst, in denen sich die Klimamerkmale der ersten zwei gegenseitig durchdringen. Die Verstärkung der allgemeinen Luftzirkulation als Folge der Klimaerwärmung verursacht aber große unperiodische Veränderungen im Ablauf der Jahreszeiten. Ein konkludentes Beispiel stellt der Sommer des Jahres 2007 dar, als die höchsten Tagestemperaturen der Monate Juni, Juli und weniger August Abweichungen von über 20°C von den langjährigen Mittelwerten eingetragen haben, die das Erscheinen der heißen Tage (mit Temperaturen $\geq 35^\circ\text{C}$) verursachten. In der Arbeit sind die Klimamerkmale der Sommermonate 2007, im Vergleich zu den langjährigen Merkmale dieser Monate, untersucht, sowie die Ursachen die dazu getragen haben. Die Schlußfolgerungen heben die Tatsache hervor, dass in der Geschichte der rumänischen Meteorologie der Sommer des Jahres 2007 der heißeste war, mit zwei Werten in Juni, fünf in Juli, und eins in August. In Juni 2007 wurden 13 heiße Tage eingetragen und die Lufttemperatur (42°C / 26.06.2007 bei Cujmir) hat den alten Rekord von 42.0°C / 29.06.1938 ausgeglichen, der bei Oravița im Süd-West Rumänien registriert wurde. In Juli 2007 wurden 10 heiße Tage eingetragen und die höchste Temperatur hat Werte von $\geq 40^\circ\text{C}$ bei 49 Wetterwarten erreicht, bei fünf von denen die Werte $\geq 44^\circ\text{C}$ waren: 44.0°C bei Băilești, Moldova Nouă und Moldova Veche, 44.2°C bei Bechet und 44.3°C bei Calafat / 24.07.2007; dieser letzte Wert hat mit 0.8°C in nur 7 Jahren den alten Rekord des Monats Juli überholt. Die letzte Wärmewelle war in der Zeitspanne 22–25.08.2007, aber der Wert von 40°C wurde nicht mehr erreicht. Die Folgen der Gluthitze dieses Sommers waren zahlreiche, sowohl für die Umwelt (dauerhafte Dürre, schwache oder vernichtete Ernten usw.), als auch für die Gesundheit der Bevölkerung (der Temperatur-Feuchtigkeit Index hat die kritische Schwelle von 80 Einheiten überholt und 30 Todesfälle wurden in ganz Rumänien registriert).

1. INTRODUCTION

The climate of Romania is temperate – continental with four seasons; two of which are extreme, that is hot, occasionally torrid in summer and cold, sometimes frosty in winter. There are two transitional seasons – spring and autumn, which may show some traits common to the two extreme seasons.

As climate warming intensifies the general circulation of the atmosphere, the seasonal evolution presents big unperiodic variations. Such a situation happened in the summer of 2007, when the daily maxima of June, July and of a few August days registered deviations of over 20°C from the multi-annual mean temperatures, ringing about canicular days ($\geq 35^\circ\text{C}$).

This phenomenon developed as waves of tropical heat kept steadily coming in, so that June and July became the hottest months, in the last seven decades. Having in view the great material losses and casualties caused by those dog days, we are justified in listing that summer's climatic anomalies under *meteo – climatic hazards*¹.

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¹ Canicular is a term originating from the Latin *canis* (dog). It is known from Roman Times, when people considered to relate to the Star Sirius – Canicular Sirius, Canis Constellation (Eng. dog days).

In order to get an insight into the specific aspects of the 2007 canicular events in Romania, a brief outline of the general climatic traits of June and July would be helpful.

June is the first summer month featuring the most unstable weather all over the year; it is the rainiest months with a peak pluviometric record. Clear skies and warm days alternate with overcast, cold and rainy days. One may experience tropical days and nights, as well as frosty days.

Thermal contrasts materialise in waves of tropical heat (30°–35°C) and of polar cold (–1°, –2°C). Three cases of extreme temperatures were recorded in the 20th century: on June 29, 1938 $\geq 42^\circ\text{C}$ at Oravița in the south-east of Romania; $\geq 40^\circ\text{C}$ at Giurgiu on the banks of Danube, and 40.3°C at Filaret station in Bucharest, the country's capital. The longest interval of negative temperature days occurred in June 1950 when, for 13 days in a row, they registered -20°C at Gheorgheni and -2.7°C at Intorsura Buzăului, both located in closed Intracarpathian depressions, the last value representing a negative June thermal record for Romania.

Pluviometric contrasts have multi-annual means of 500–600 mm in the lowland plains and 1,000 mm in the high mountain regions (>2,000 a.s.l.) but also 0.1–5 mm/month. Exceptional quantities of rain/24 hrs: 348.9 mm on June 26, 1925 at Ciupercenii Vechi in the south-west of Oltenia region and 530.6 mm on August 29 at C.A. Rosetti in the Danube Delta, the last value being a record high in Romania.

July is the hottest month of the year in all of the country's regions below 1,800–2,000 m a.s.l. It is the time when relatively frequent waves of heat bringing in tropical days and nights.

In the 20th century there were 220 cases, most of them in 1985, of $\geq 40^\circ\text{C}$ in the south and south-east of the country: at Turnu Măgurele (16 times), Roșiori de Vede (14 times), Giurgiu (13 times), Zimnicea and Bechet (10 times), Călărași (9 times), București – Filaret (8 times), etc.

Most days with $>40^\circ\text{C}$ temperatures were registered by 42 weather stations on July 5, 2000, with an absolute maximum for this country of 43.5°C at Giurgiu, actually by only 1°C below the absolute thermal record in Romania (44.5°C on August 10, 1951). July is the month with the longest interval of tropical days in the 20 century: 24 at Drobeta Turnu Severin in 1904.

2. CHARACTERISTIC FEATURES OF THE 2007 CANICULAR WEATHER

The torid June weather set in after a warm, Mediterranean-like winter followed by a very early and dry spring which began in the second decade of February.

In the first interval of June, temperatures were below the multi-annual mean. The first heat wave, which came between 17-26 ushered summer in, peak values being registered on June 26 (Fig. 1).

The torid weather lasted for 13 days, when the Temperature – Humidity Index (THI) reached the critical threshold of 80 units.

The excessively hot weather was being felt throughout the country, with maxima of 36–42°C in the southern region *e.g.*, in south –west Oltenia:

A temperature of 42°C equalled the old June record in Romania (29, 1938 at Oravița). Noteworthy, the June 2007 maximum values were by 3–4°C higher than in June 2000, the year of the second severe drought after the 1945-1946 one, although at that time there had been no temperatures above 40°C.

Canicular with the Romans was an astronomic phenomenon overlapping the July 22 – August 23 interval when Sirius rises and sets with the Sun, ill – amened period in their view, when sear borled, wine was soured by the heat, dogs grew mad, all creatures lost in vigour, the high temperatures causing insolation, severe burns in men, animals, planets, vegetables, fruit, etc.; forests withered and natural fires burst out over vast areas, a picture very similar to the summer of 2007.

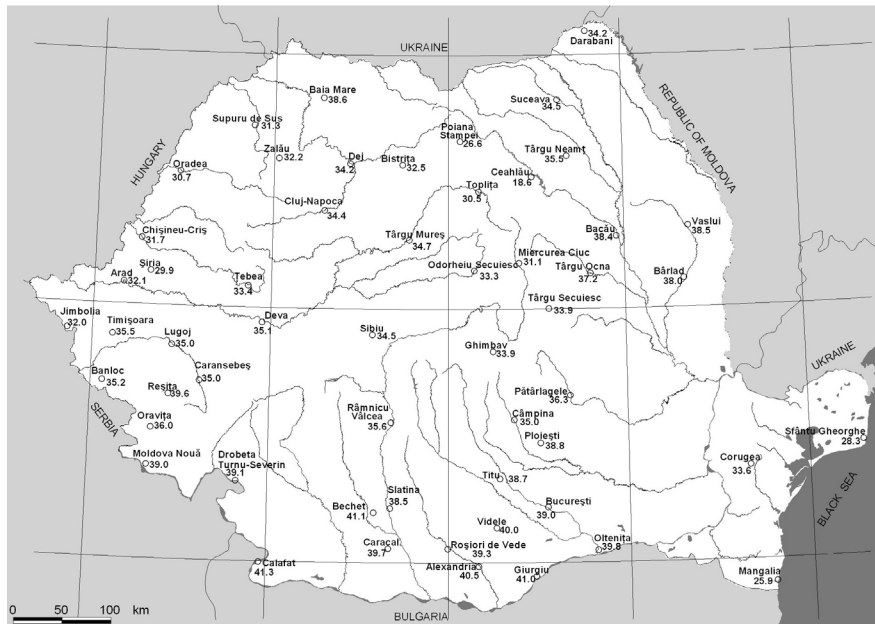


Fig. 1 – Maximum air temperature values recorded in Romania on June, 26, 2007.
(source: National Meteorological Administration).

3. THE AFTERMATH OF THE JUNE 2007 CANICULAR SUMMER

This extreme weather set on in the midst of the vegetation period, therefore it had dramatic consequences: the consumption was by ca 500MW/day above the normal summer value, a record high for Romania; 60% of the cereal crops and much of the hoeing crops were compromised, meadows withered, wells got dry, livestock suffered, too, the level of watercourses dropped and navigation on the Danube came to a halt; the critical THI values (with a peak of 87.7 at Băilești on June 26) (Fig. 2) left 30 people dead in this country.

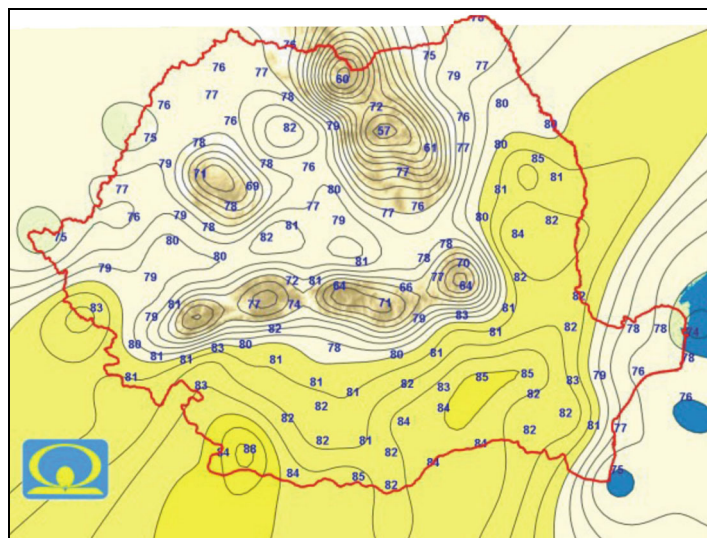


Fig. 2 – Temperature-Humidity Index (THI) value distribution of peak heat wave on June 26, 2007, 17: 00 hrs Romanian Summer Time.
(source: National Meteorological Administration).

4. PARTICULARITIES OF THE JULY 2007 TORID WEATHER

As from the latter half of June, temperatures began resembling ordinary July values. The first heat waves hit the country on July 2–4, 8–10, 15–24 and 27–30, the last but one interval being the hottest, the meteorological observations of that month, indicating peak values on July 24 (Fig. 3).

Within a lapse of 84 years, maximum 20th-century July temperatures rose by 6°C: 42.9°C on July 5; 1916 at Alexandria and 43.5°C on July 5, 2000 at Giurgiu, while in the 21st century the increase was of 0.8°C only within the first seven years alone, from 43.5°C on July 5, 2000 at Giurgiu to 44.3°C on July 24 at Calafat, an absolute thermal record for this month in Romania.

Thus, it was for the first time in July 2007 that the thermal threshold of 40°C was crossed at 49 stations (by seven more than in July 2000).

Statistics show values of 40.0–49.0°C at twenty-two stations; 41.0–41.9°C at eleven stations; 42.0–42.9°C at seven stations; 43°C at four stations and over 44°C at five stations: Băilești, Moldova Nouă and Moldova Veche <44.0°C; Bucharest, 44.2°C and Calafat 44.3°C, a July thermal record.

5. THE AFTERMATH OF THE JULY 2007 TORID WEATHER

Consequences appeared to be even more dramatic than in June, as negative effects kept cumulating and augmenting the drought that had already destroyed crops, withered meadows killed livestock, dried up wells and depressed water levels down to a record low, affecting navigation on the Danube; fires burst out burning forests and vegetation, electricity consumption doubled as household and air-conditioned devices functioned at full capacity causing black-outs (Fig. 3).

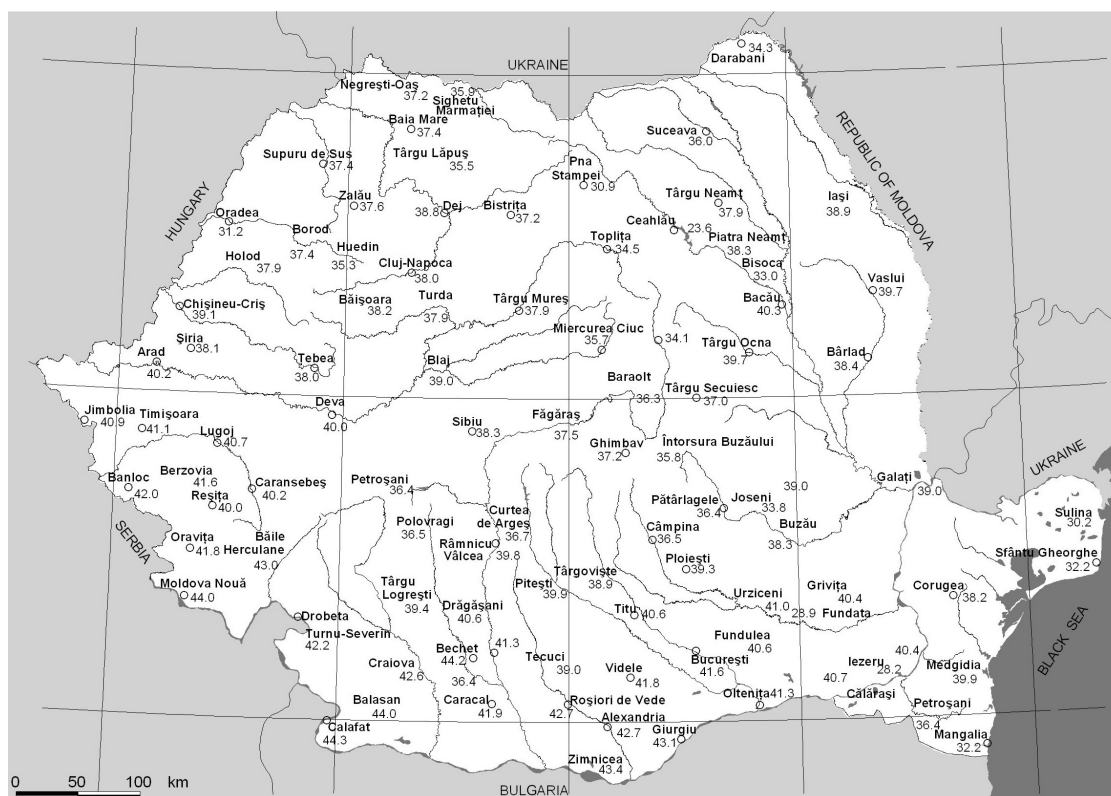


Fig. 3 – Maximum air temperature values recorded in Romania on July, 24, 2007.

(source: National Meteorological Administration).

The Temperature-Humidity Index (THI) reached and crossed the critical threshold of 80 units throughout the country, a value registered in the mountain region, too (Fig. 4), and leaving 33 people dead that month alone.

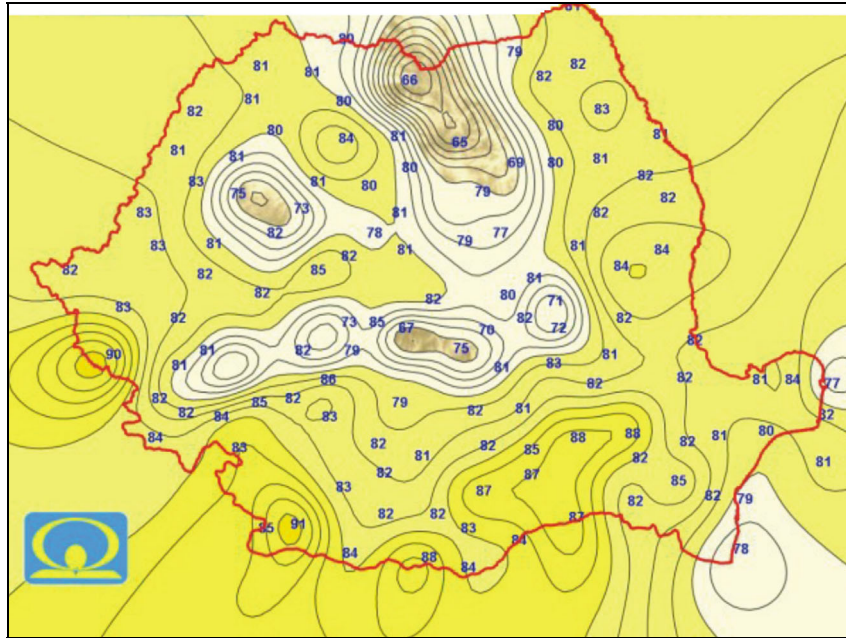


Fig. 4 – Temperature-Humidity Index (THI) value distribution on July 24, 2007, at 17: 00 hrs Romanian Summer Time. (source: National Meteorological Administration).

As from July, weather forecasters instituted warning codes for maximum temperature and THI values:

- yellow code (low risk): 33°-38°C and ≤ 65 THI units;
- orange code (moderate risk, state of alert): 38.1°-40.0°C and 66-79 THI units;
- red code (high risk): >40°C and ≥ 80 THI units.

6. A SYNOPTIC APPROACH TO THE CAUSES OF THE 2007 CANICULAR SUMMER

Dod days in June started to the 17th, when a vast Icelandic advection reached western Europe and Northern Africa carried by a talweg developed over the Atlantic Ocean, bringing hot and dry continental air currents to Romania. That situation is perfectly illustrated by the synoptic picture on the ground (Fig. 5) and the thermal field at 850 hPa (Fig. 6).

The canicular peak reached on June 2006 was the result of a weakly positioned cyclonic area in the north of Italy enhancing the tropical – continental African air advection over the south of Italy and the Balkan Peninsula (Fig. 7).

The thermal field of the 850 hPa level (Fig. 8) highlights the 25°C isotherm positioned on the south-eastern parts of Oltenia and Muntenia at some 5000 m altitude, illustrating the advance of the thermal equator northwards. A mass of cold air coming from North-Eastern Europe dislodged the preexisting warm air within 24-48 hours, unleashing severe meteorological phenomena: wind gusts, hail storms, torrential rains, etc. that tore air cables, snatched roofs (*e.g.* at Drobeta Turnu Severin and Târgu Jiu), causing a fifty-minute waterspout on the surface of the Danube in front of the Drobeta Turnu Severin watch post.

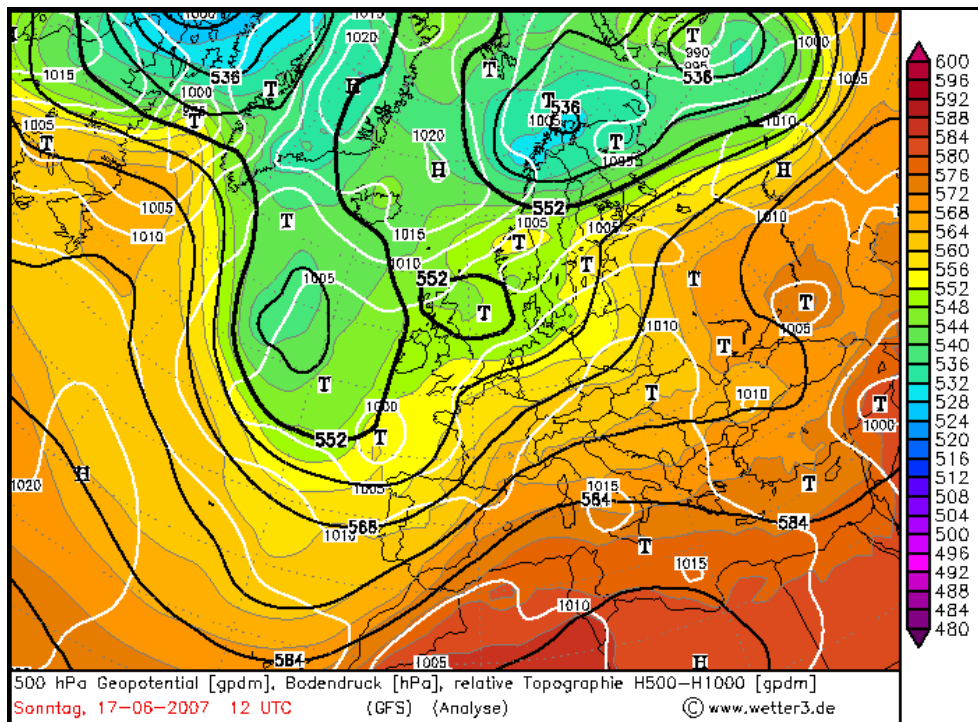


Fig. 5 – Ground Synoptics, Geopotential Field at 500hPa (5,500 m altitude) Isobaric Area Level and Relative Topography RT 500/1,000 hPa on June, 17, 2007, at heat wave start (source: *Karten Archive*).

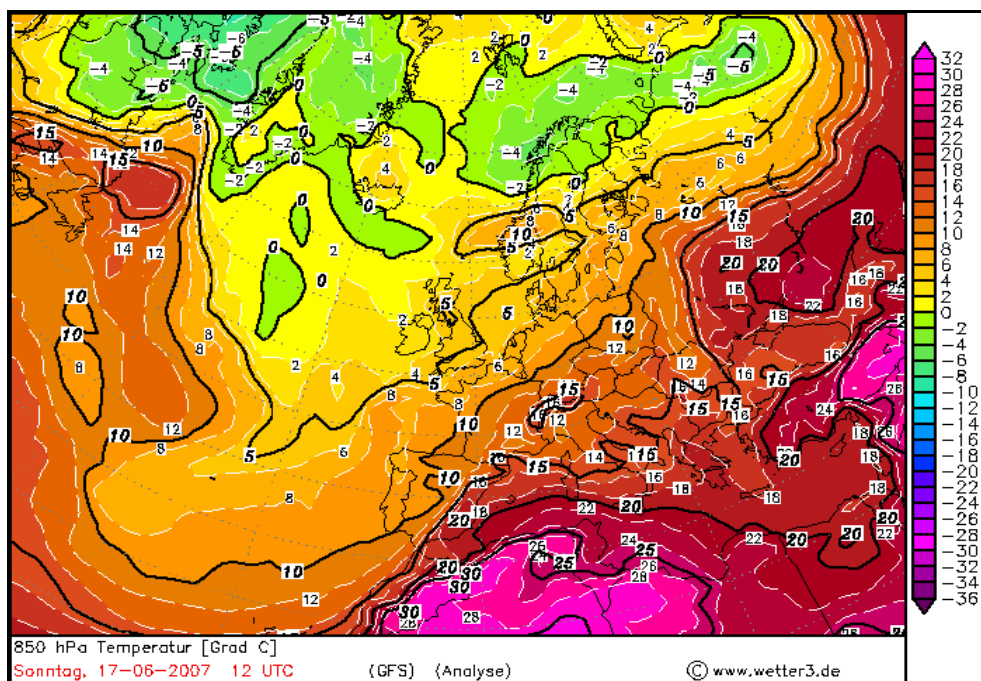


Fig. 6 – The thermic field at 850 hPa Isobaric Area Level (1,500 m altitude), on June, 17, 2007, 12:00 hrs UTC (source: *Karten Archive*).

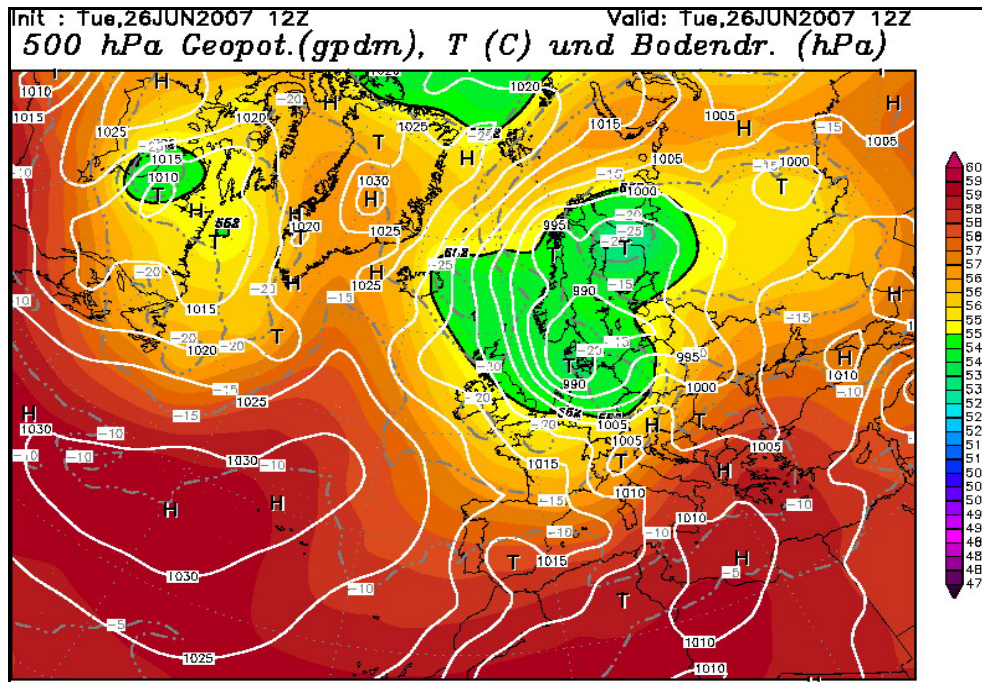


Fig. 7 – Ground and Altitude Synoptics Level at 5,500 m altitude on June, 26, 2007, 12:00 hrs UTC, when the maximum warming phase of June 2007 occurred (source: *Karten Archive*).

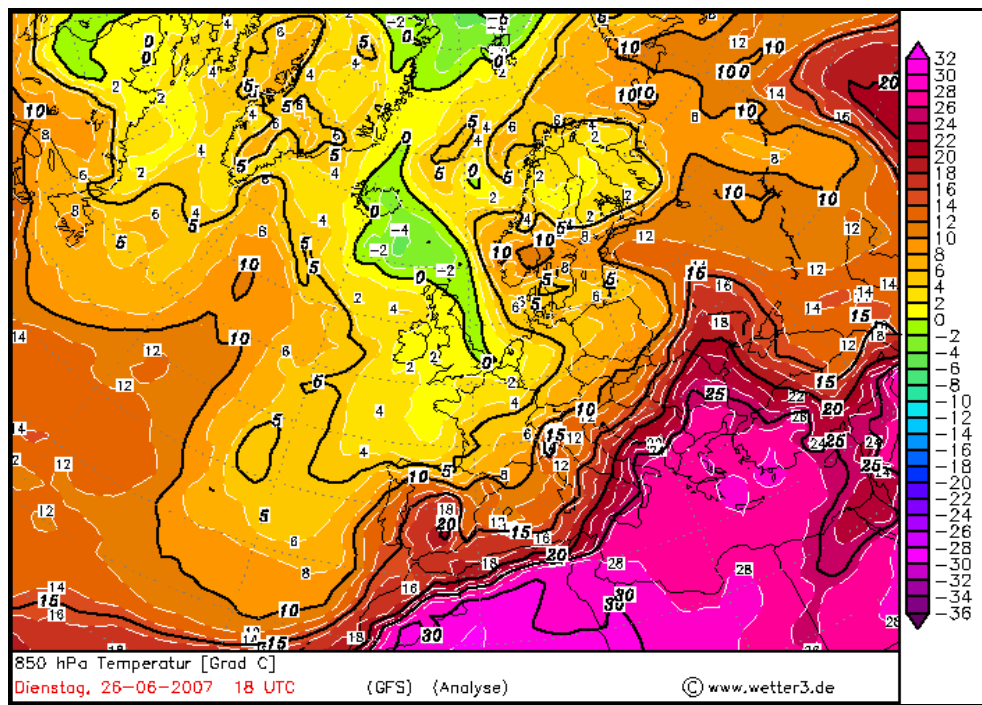


Fig. 8 – The Altitude Term Field at 850 hPa (around 1,500 m altitude) Level on June, 26, 2007, 18:00 hrs UTC, at the time of maximum phase of warming process (source: *Karten Archive*).

The weather began heating up on July 15, the peak being reached on the 24th.

The synoptic situation on the 15th of July was typical of the positive phase of the North Atlantic Oscillation (NAO+) (Fig. 9).

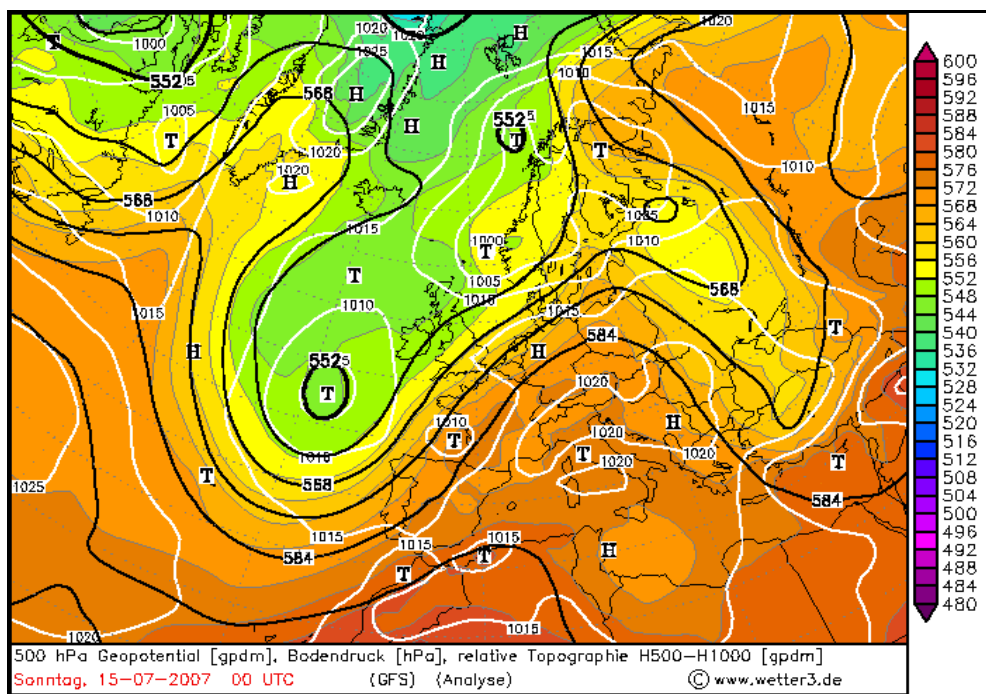


Fig. 9 – Ground Synoptics, Geopotential Field at 500hPa (5, 500 m altitude) Isobaric Area Level and Relative Topography RT 500/1,000 hPa on July, 15, 2007, 18:00 hrs UTC (source: *Karten Archive*).

It becomes obvious how the two lobes of the Icelandic Depression cover the 1000 hPa value in the centre of the Atlantic Ocean and the Scandinavian Peninsula; the Azore Anticyclone is pushed far northwards on the Continent, joining the North-African Anticyclone, centre value 1020–1025 hPa, which covers about two-thirds of Europe (east-southern part).

The thermal field of 850 hPa Area Level (ca 1,500 m alt.) (Fig. 10) indicates the presence of a tropical continental air core of Saharan origin and temperatures of 30°C, advancing towards the south-east of Europe; at a height of 2 m, the air temperature was 35°–37°C.

The synoptic situation favoured the expansion of the hot air over Romania as well.

On the 24th of July the synoptic situation on the level of the 500 hPa isobaric area indicated the prevalence of the North-African tropical continental air, the 500/1000 relative topographic field showing that the warm air advanced in the lower troposphere farthermost north of Romania (Fig. 11).

The thermal field at 850 hPa isobaric area level (ca 1, 500 m alt.) revealed the presence of the 24°C isotherm occurring south of the Danube, an indication of warm air advancing over Romania. On July 24, the maximum heating phase on the ground occurred between 16.00 and 18.00 hrs RST, when many of the temperatures turned out to be absolute July maxima for Romania.

The apex of this phase was reached at 18:00 UTC (21.00 RST, when the 30°C isotherm was positioned at the 850 hPa level (ca 1, 500 m alt.) over the south-western territory of this country (Fig. 12), a situation never encountered before. The warming process was enhanced also by the progression of a cold front coming from the west of Europe towards Romania and dislocating and compressing the warm air.

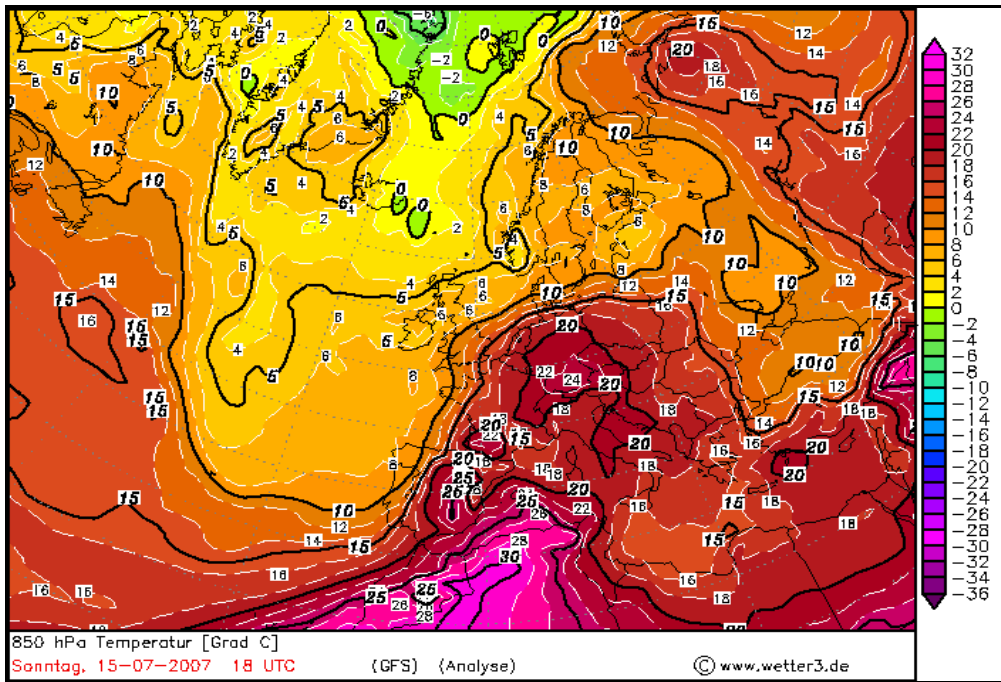


Fig. 10 – The thermic field at 850 hPa Isobaric Area Level (1,500 m altitude), on July, 15, 2007, 18:00 hrs UTC when the warm wave was initiated (source: *Karten Archive*).

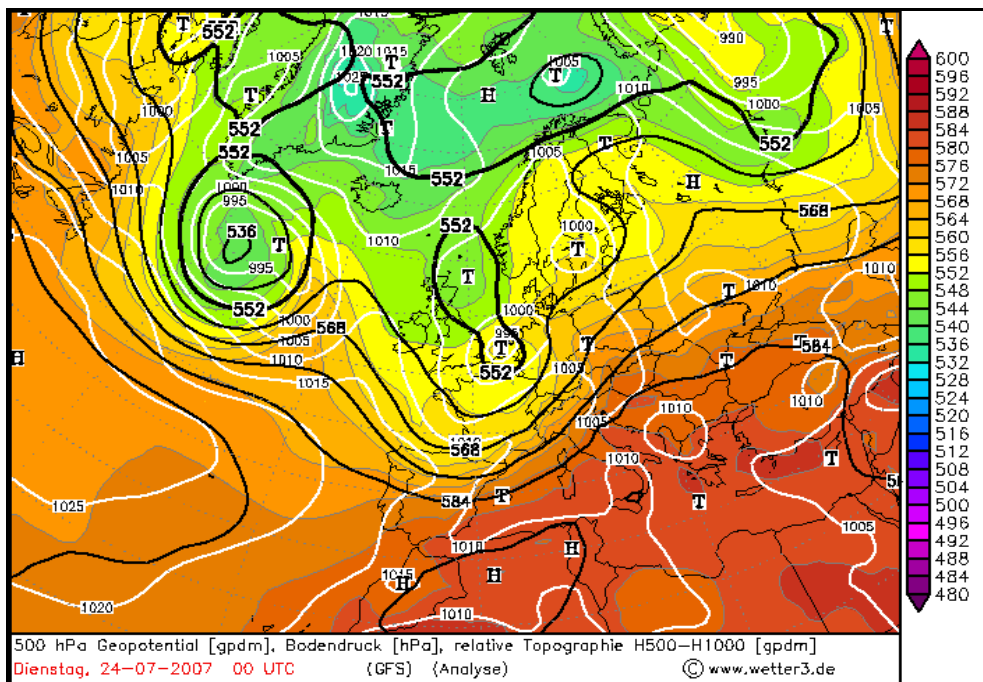


Fig. 11 – Ground Synoptics, Geopotential Field at 500hPa (5, 500 m altitude) Isobaric Area Level and Relative Topography RT 500/1,000 hPa on July, 24, 2007, 18:00 hrs UTC (source: *Karten Archive*)

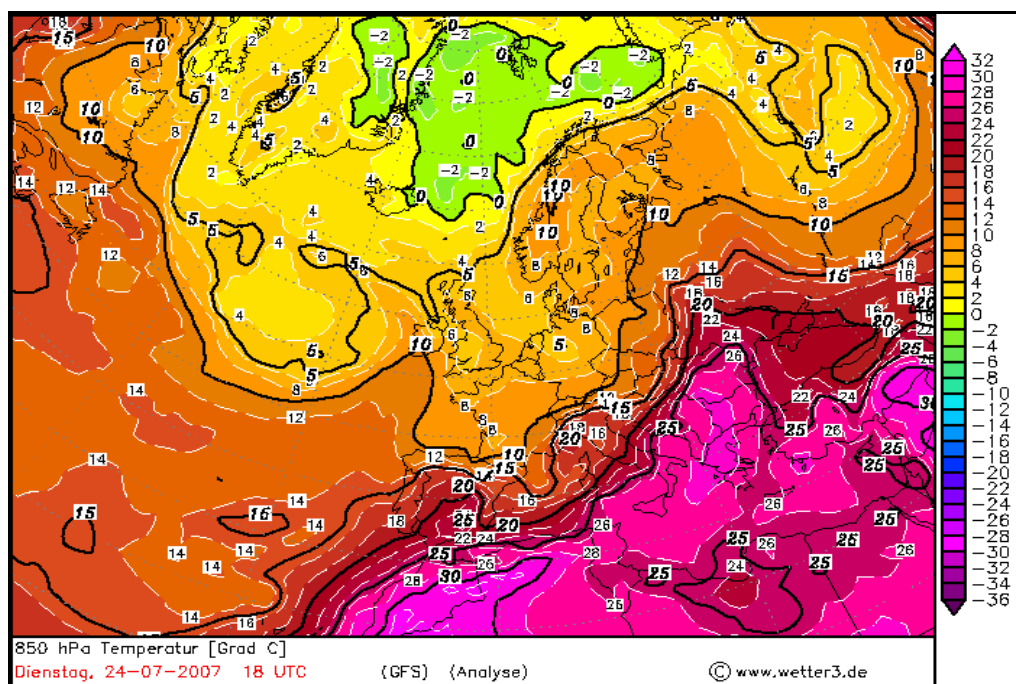


Fig. 12 – The thermic field at 850 hPa Isobaric Area Level (1,500 m altitude), on July, 24, 2007, 18:00 hrs UTC at the heigh of warm maximum phase (source: *Karten Archive*).

On the night of 24/25, the air began cooling up, while the temperature fell by 10-15°C against the previous day; however, maximum values continued to stay high, rising locally to over 35°C also on July 25, the minimum being 25/27°C.

As from the 26th of July the weather returned to normal, August 5/7 witnessing rainfalls associated with floods in Suceava and Iași counties.

The temperature shot up again in August (22/25) but not as high as 40°C. The last heat wave occurred on August 24 ($\geq 38^\circ\text{C}$).

The fact is that canicular periods are not the work of atmospheric circulation and astronomic events alone. The specialist literature, for example, considers that Planet Eris, or the planet with 50 names (Nibiru, Marduk, Nemesis, Planet of the Gods, Planet of the Empire, Planet of the Cross, the Red Planet, etc.), given by the ancient civilisations, exerts an overwhelming influence on global warming.

Its evolution around the Sun equals 3, 600 terrestrial years, which means that it enters our solar system once every 3,600 years, heating the atmosphere and melting glaciers. According to calculations, Eris will be closest to Earth between 2010 and 2012, exacerbating warming processes, droughts and other phenomena (e.g. volcanic eruptions).

CONCLUSIONS

The 2007 canicular summer data discussed in this paper illustrate the variability of the climatic system, and suggest possible climate changes expressed by several meteo-climatic phenomena, atypical for the temperate-continental zone Romania is located in.

Some of these phenomena are listed below:

- summer temperatures occur two weeks earlier; the hot air layer ($>30^\circ\text{C}$) rises up to 5, 000 m a.s.l.;
- the frequency and intensity of heat waves in the warm season have been increasing from 2–3 cases/decade in the 20th century to 5–6 or more higher in 21st century June;

- canicular intervals keep lengthening from a few days to nearly 2–3 weeks (13 days in June 2007 and 10 days in July 2007);
- tropical days and nights become ever more frequent;
- heat waves occur the earliest in the south-west of Oltenia, warm air penetrating along the Danube Gorge and the Timok Valley;
- heat waves are recorded also in winter, intensifying droughts, severe heat and fires in the following seasons;
- droughts become more frequent and last longer;
- higher minimum temperatures and new monthly maxima are being recorded;
- aridization processes in the south-west of Oltenia, and in other regions grow in intensity.

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CONSIDERATIONS ON THE TIMBERLINE IN THE RODNA MOUNTAINS NATIONAL PARK

GHEORGHE KUCSICSA*

Key-words: artificial timberline, mountain region, protected area, Rodna Mts.

Betrachtungen über die obere Waldgrenze im Nationalpark der Rodna-Gebirge. In den Rumänischen Karpaten, verzeichnet die obere Waldgrenze beträchtliche Variationen. Dies verdankt sich sowohl den natürlichen Faktoren (klimatische Bedingungen, Höhe und geographische Breite wo die Gebirge liegen, Reliefgestaltung, geomorphologische Besonderheiten usw.) als auch dem menschlichen Einfluss. In den Rodna-Gebirgen, widerspiegelt sich der menschliche Eingriff heutzutage, mit dem Wunsch die Weidenflächen, als auch jene für die Ausbeutung der Wälder in der Nähe deren Grenze, auszuweiten, in der viel niedrigeren oberen Waldgrenze im Vergleich zu jener natürlichen, insbesondere in den am meisten zugänglichen Orten. Die Höhenabweichung der oberen Waldgrenze ist im Durchschnitt bei 200–300 m eingeschätzt, mit höheren Werten auf den südlichen Hängen, wo, in manchen Stellen, die obere Waldgrenze durch den menschlichen Eingriff auch bis zu 1 200–1 300 m hinabgestiegen ist.

INTRODUCTION

Situated in the vicinity of the transition area between the forest vegetation and the alpine meadows, the timberline (pre-sub-alpine forest) (Bândiu and Doniță 1988) presents a special interest due to its ecological importance. Avoided because of difficult access, the tree line still preserves a natural character in many places. In the Romanian Carpathians, the timberline exists in all the mountain ranges above altitude of 1,500–1,600 m (Geanana 1972). They cover larger areas in those mountains that display a developed alpine belt, such as the Rodna, Călimani, Bucegi, Piatra Craiului, Făgăraș, Parâng, Retezat, etc.

The specialist literature distinguishes two special types of tree line, namely:

– *the natural limit*, where trees of all ages are rather low and have a small diameter. The upper limit of the forest is established where tree height is below 8 m (Bândiu and Doniță 1988). The natural upper limit of forests in the Romanian Carpathians is generally climate-related and varies according to latitude and altitude, exposure, geo-morphological particularities, etc.;

and

– *the anthropic limit*, affected especially by grazing and wood exploitation, which result in the lowering of the natural limit.

STUDY AREA

The Rodna Mountains National Park is part and parcel of the Rodna Mountains situated in the north of Romania, approximately in the central part of the Carpathian Chain (47°31'N, 24°45'E) (Fig. 1).

The Park itself lies at some 1,600 m a.s.l., basically between 700 and 2,303 m (Pietrosu), featuring one of the most imposing alpine landscapes in the Romanian Carpathians. The Park displays a multitude of glacial and cryo-nivation traces, glacial lakes –the Iezerul Pietrosului, Iezerul Buhăescului, as well as endo- and exo-karstic forms modelled in crystalline limestone (Bălțeanu *et al.* 2006).

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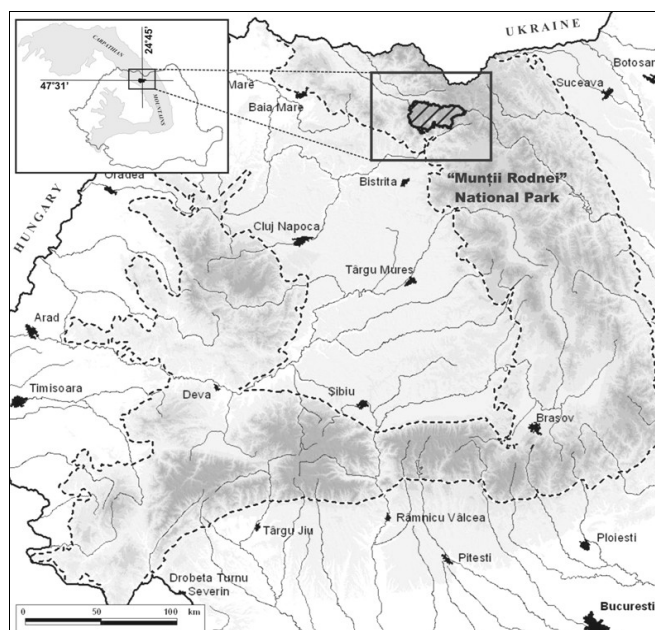


Fig. 1 – Location of the study area in Carpathian Mountains.

From a total of approximately 32,000 sq km of mountain forest in Romania, about 2% lie in the Rodna Mountains and nearly 1% in the Rodna Mountains National Park. Here, forests represent the main category of land use, making up for 60% of the Park's surface area (ca 280 sq km).

Depending on changes in the environmental factors, there is a distinctive difference in limits between the tree cover in belts and sub-belts. More often than not, the present limit between belts and sub-belts is not the natural one, because man has largely influenced elevation and lowering (Coldea 1990; Bălțeanu and Kucsicsa 2010), particularly of the timberline.

TIMBERLINE IN THE RODNA MOUNTAINS NATIONAL PARK

Taking into account the present climatic conditions, as well as the altitude and latitude at which forests lie, the timberline in the Rodna Mountains is considered to be at 1,800–1,850 m alt. on the southern slope and by 100–150 m lower on the northern slope (Geanana 1972).

The most common natural timberline species in these mountains is *Picea abies*, but also *Pinus cembra* (mostly in the east). When the man-induced tree line goes down, deciduous species are seen beside the resinous ones, e.g. *Fagus sylvatica* (largely in the south and south-west), *Sorbus aucuparia* and *Betula pendula*.

In most cases, the height of timberline trees in the Rodna Mountains exceeds 8–10 m, which indicates that, in general, the present forest is not at its natural limit. In the transition area between the forest belt and the sub-alpine belt the upper limit of the forest is usually artificially lowered by human pressure (Fig. 2). Here, especially 20th century deforestations to expand grazing fields and obtain timber have destroyed mainly the dwarf pine and the open wood land spruce, large compact areas having been cleared up.

Since spruce woods in the Rodna Mountains are the last forest belt and softwood timber is the main material for the internal and external markets, or for the reinforcement of mining galleries, the areas occupied by sub-alpine and alpine meadows have kept lowering in the wake of deforestation. As a matter of fact, numerous toponyms found in these areas (*nedeie*, *tomnatic*, *prelucă*, *pleș*, *poiană*, *arșiță*, *secătură*, etc.) reflect the practice of shepherding and deforestation (Kucsicsa 2009).

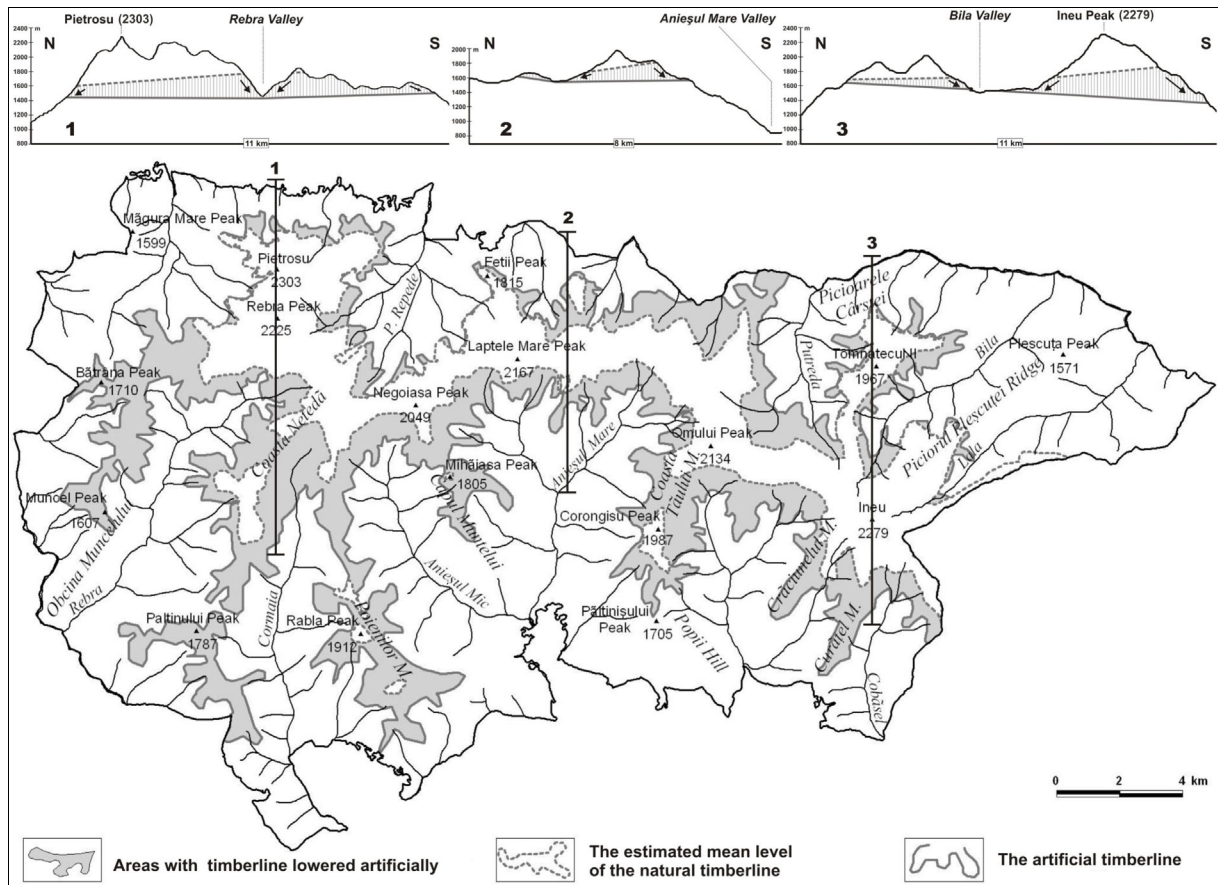


Fig. 2 – Lower timberline than the natural limit in the Rodna Mountains National Park.

The natural limit usually exists in hardly accessible areas, especially on the northern slope of the Rodna Mountains (Hotarul, Curmătura Pietrosului and Piciorul Plescuței summits, Mount Gaja, etc.).

Timberline variations. The present finger-shaped timberline shows great variations in the south and south-west of the Park. The average vertical amplitude is estimated at some 200–300 m. The greatest variations occur on the southern summits of the Park (Coasta Neteďă, Coasta Tăului, Mount Poienilor, Mount Crăciunelul and Mount Curățel), where the limit stands at 1,200–1,300 m, which is by 500–600 m lower than the natural limit on the northern slope (Fig. 3), where notable variations can be found in the hydrographic basins of the Izvorul Repede, Bistricioara, Putreda and Bila.

In relation to the natural tree line, the largest deforested areas are seen on the southern slope (approx. 70%), basically between 1,600 and 1,800 m (35%) and 1,400–1,600 m (31%) (Fig. 4). These differences are due not only to the larger surface of the slope, hence a much larger forested area than on the northern slope, but also to more favourable natural factors.

Since forest exploitation and grazing are closely related to the degree of terrain accessibility and to the value of the grazing fields, human pressure on the timberline of the northern slope was less intense. Here, geomorphological conditions (fragmented relief, large areas of debris-covered outcropping rocks, unfavourable exposure) have largely stopped forest exploitation at higher altitudes, and reduced shepherding as well (Morariu 1937).

The present tree line in the Rodna Mountains National Park lies at some 1,600 m on average, with a difference of about 50 m between the two main slopes. Thus the upper limit of the forest on the

northern slope is situated at approx. 1,600–1,650 m, and at some 1,550–1,600 m on the southern slope, even though it lies 50–100 m higher on the latter compared to the former. About 56% of the timberline is situated at 1,400–1,600 m alt., while approximately 32% lie at 1,600–1,800 m (Fig. 5).

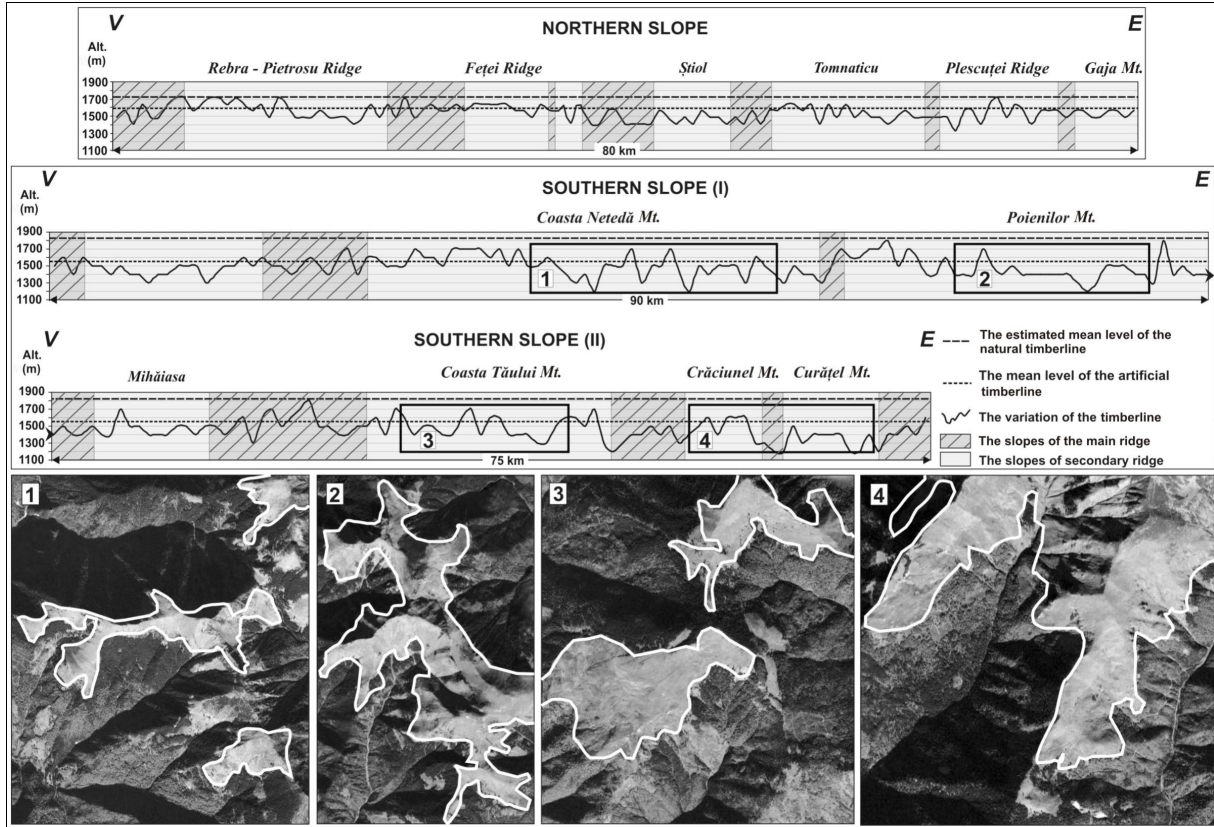


Fig. 3 – Timberline variations on the slopes of the main and the secondary ridges in the Rodna Mountains National Park.

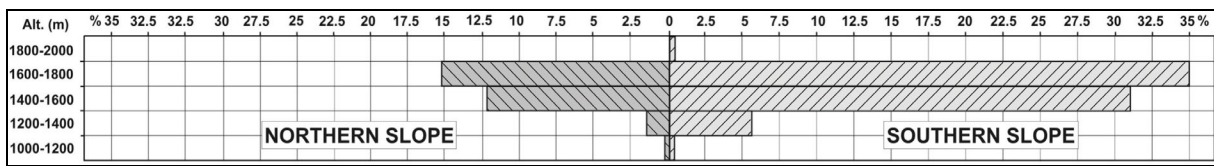


Fig. 4 – The rate of deforested areas by relief steps to the natural timberline in the Rodna Mountains National Park.

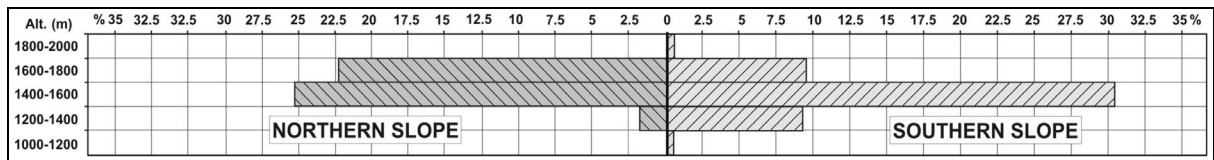


Fig. 5 – Timberline distribution by relief steps in the Rodna Mountains National Park.

CONCLUSIONS

Human pressure exerted on the forest vegetation in the Rodna Mountains National Park is reflected in fragmented forests over large areas with an upper limit significantly lower than the natural one.

Notable changes are seen especially on the southern slope, which being more accessible has favoured large-scale shepherding; also deforestations in the transition area between the forest and the sub-alpine belts have been intense more than on the northern slope.

In the Rodna Mountains National Park, the present finger-shaped timberline is situated at approximately 1,600 m, with significant differences at the level of the two main slopes.

ACKNOWLEDGMENTS: The present work has been supported by the Romanian Academy/Institute of Geography, Project No. II.1.2/2010.

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THE INTERNATIONAL GEOGRAPHICAL UNION REGIONAL CONFERENCE

July 12–16, 2010, Tel Aviv, Israel

The 2010 Regional Conference of International Geographical Union (IGU) was held in Tel Aviv, Israel on July 12-16. The event was hosted by the Israeli National Commission for Geography and jointly organized by the Department of Geography and Environmental Studies, University of Haifa; Department of Geography, Hebrew University of Jerusalem; Department of Geography and Human Environment, Tel Aviv University and Department of Geography and Environment, Bar Ilan University. The central theme of this scientific event was focused on *Bridging Diversity in a Globalizing World*. Within the conference, the IGU Commissions integrated their meetings and discussions: Land Use and Land Cover Change, Mountain Response to Global Change, Applied Geography, Climatology, Urban Commission: Emerging Urban Transformations, Political Geography, History of Geography, Geographical Information System, Hazard and Risk, Land Degradation and Desertification, etc.

This prestigious event gathered nearly five hundred presentations and posters which were grouped on several sessions on the following general topics: Political Geography, Local Development, Tourism, Leisure & Global Change, History of Geography, Cultural Approach in Geography, Geomorphic Challenges, Geography & Governance, Hazard and Risks in a Globalizing World, Urban Commission, Gender and Geography, Arid Lands, Humankind and Environment, Global Information Society, Marginalization, Globalization & Regional & Local Response, Islands, Climatology, Population Geography, Land Use & Land Coverage, Geographical Education, Applied Geography, Modelling Geographical Systems, Karst, Health and Environment, Land Degradation & Desertification, Dynamics of Economic Spaces, Environmental Evolution, Water Sustainability, Biogeography & Biodiversity and Geographical Information System.

From Romania the following papers were presented: “*Environmental changes in the Bucharest Metropolitan Area*” (D. Bălțeanu, I. Grigorescu); “*L’agrotourisme en Roumanie, une activité nécessaire pour l’espace rural*” (G. Camară, D. Tudora); “*The impact of in-migration flows on the rural economy: the case of Romania*” (L. Guran-Nica, M. Sofer, M.E. Teodorescu, R. Săgeată); “*Opportunities for Development of Tourism Traffic on the Romanian Black Sea Coastline*” (M.T. Andrei, T. Simon); “*Ciucaș Mountains – specific landforms and their role in tourism development*” (G. Posea, C. Marin, M. Andrei, L. Guran-Nica); “*Le potentiel geomorphotouristique des Souscarpatés d’entre la Ialomița et la Prahova*” (M. Mihăescu); “*Biodiversity in Judea lowland*” (H. Moyal, V. Surd); “*The impact of tourism on climate change in European Union*” (I. Pop, M. Andrei) and “*Socio-economic characteristics of the elderly population in Romania*” (D.V. Nancu, L. Guran-Nica, M. Persu).

Numerous field trips and activities were arranged by the IGU Commissions and the Conference Steering Committee before and after the conference in order to enable the participants to explore the landscape of Israel.

Ines Grigorescu

PLUREL CONFERENCE: MANAGING THE URBAN-RURAL INTERFACE,
STRATEGIES AND TOOLS FOR URBAN DEVELOPMENT
AND SUSTAINABLE PERI-URBAN LAND USE RELATIONSHIPS

19–22 October, 2010, Copenhagen, Denmark

The PLUREL conference “*Managing the urban-rural interface*” was held in Copenhagen, Denmark on October 19 – 22, 2010. The event was hosted by the Faculty of Life Sciences, University of Copenhagen Frederiksberg, Denmark as the final event of the **PLUREL project: Peri-urban land use relationships – strategies and sustainability assessment tools for rural-urban linkages** funded by the European Commission’s sixth Framework Programme for research (EC FP6 036921).

The conference was organized jointly by several Danish scientific and governmental and non-governmental bodies such as: the PLUREL project, Landscape Tomorrow, Danish Association of Landscape Ecologists, Danish Architecture Centre; International Union of Forest Research Organizations etc. and targeted a broad spectrum of participants aiming to encourage the multidisciplinary of research in urban and rural linkages

The scope of the event was to present the current status in assessing the peri-urban land-use relationships, to set the agenda for future research in the field, and enhance international research cooperation.

The topics of the sessions were concentrated on: urban-rural regions in a globalised world: driving forces on land use change; scenarios: futures for rural-urban regions; land-use relationships and the structure of the rural-urban system: European and regional models; rural-urban land use dynamics: impacts on resource demands and utilisation; quality of life and ecosystem services in rural-urban regions; growth management and governance systems in rural-urban regions; locally adapted strategies for rural-urban regions: from understanding of issues to finding of solutions; sustainable multifunctional landscapes in peri-urban areas; economic evaluation of policies affecting land use in rural-urban regions; instruments and tools for sustainability impact assessment; sustainable urban development in emerging economies; urban forestry and urban greening in developing countries; remote sensing and GIS for sustainable urban development science.

The conference hosted more than 200 participants from about 20 countries. From Romania participated dr. Ines Grigorescu with the paper entitled: *Land use/land cover changes in the urban-rural interface in the Bucharest Metropolitan Area*.

I. G.

Elena-Ana Popovici, *Piemontul Cotmeana. Dinamica utilizării terenurilor și calitatea mediului* (Cotmeana Piedmont. Land-use dynamics and environmental quality), Romanian Academy Publishing House, Bucharest, 2010, 9 chapters, 90 figures, 19 tables, 208 pages, 10 plates annexed.

This nine-chapter interdisciplinary approach represents a first study in the specialist literature of land cover/land-use changes, against the background of global environmental change. The volume presents this sector of the Getic Piedmont with highlight on the connection between land cover/land-use change and human activity.

The first part of the work expounds on major activities, impacting land-use change in other countries, also discussing distinct land-uses in terms of land-cover, the main types of change and the factors involved in it.

The methodology used relies on remote-sensing, a huge volume of statistical data, modern technique of geographical representation and on the interpretation of satellite images. Analysis and mapping resorts primarily to remote sensing, a major spatial data-source, and to Geographical Information Systems, respectively. Two land-cover/land-use classification programs are also included (*Land Cover Classification System – LCCS*, *Corine Land Cover – CLC*), as are the phases of spatial data-base elaboration.

The physical-geographical characterization of the Cotmeana Piedmont suggests that land-uses are dependent on specific material factors (relief, soil, climate, waters and vegetation). Land-use dynamics has been identified from old cartographic documents for a period spanning more than 200 years and mapped out with the help of GIS techniques. Changes of use and the factors triggering them, especially in the post-1990 period of transition, are considered in greater detail.

Furthermore, the consequences of these changes, basically the degradation of the soil, of waters and of biodiversity, and as important their impact on the environmental factors of the study area are issues of particular concern. Four areas have been singled out in which the soil is severely degraded through industrial pollution and domestic waste-dumps.

The environmental impact of farming works on the landscape, largely in the southern half of the Piedmont, is assessed by means of synthetic indicators and indexes.

The subject broached in this study has become a very topical one over the past few decades, gaining priority in the international geographical research. Finally, the possible influence of the Common Agricultural Policies (CAP) on sustainable land use is a matter of consideration.

Clear phrasing, adequate terminology, remarkable graphical material and a comprehensive bibliography qualify this volume to becoming a source of information for future approaches to land use and environmental quality.

Alina-Mihaela Corbu

Ines Grigorescu, *Modificările mediului în Aria Metropolitană a Municipiului București* (Environmental changes in Bucharest Metropolitan Area), Romanian Academy Publishing House, București, 2010, 228 pp., 112 figures, 28 tables.

The volume represents the Ph.D. thesis held in 2007 at the Institute of Geography, Romanian Academy under the coordination of Prof. Dan Bălțeanu. The author makes an important contribution to the identification of the main environmental changes in the Bucharest Metropolitan Area, as a result of human-environment relationships, assessing their consequences in the light of global change. The spatial and temporal projection of these interactions, as well as the categories of the human-induced impact are externalised as environmental types and their physiognomy.

The work is structured into four chapters to which one might add the introduction, the conclusions (in Romanian and in English) and the bibliography.

The first chapter deals with the international and national context of the establishment and development of the *metropolitan area* concept by analysing well-known patterns in terms of metropolitan development from the point of view of the human impact as a consequence of a disequilibrium in the human-environment relations. Special attention is paid to the development of metropolitan areas in Romania based on a favourable legal framework and on their role on a local and regional level in terms of optimizing territorial development, limiting urban sprawl and protecting the environment.

The second chapter focuses on the natural capital and its relation to the state of the environment.

The third chapter aims at a complex analysis of environmental change in the metropolitan area, starting with a spatial and temporal evolution of these changes related to the main stages of human intercession into this territory. Four steps have been identified since the late eighteenth century until the present-day, considered to be the most important ones in terms of human impact upon the environment: *late eighteenth century – late nineteenth century*, *the twentieth century*, *the transition period (1990–2000)* and *the post-transition period (2000–2007)*. Subsequently the main categories of change experienced by the metropolitan environment have been reviewed and analyzed, identifying the main directions of the human impact: *demographic dynamics*, *industrialization*, *farming and urban (suburban) sprawl*. *Waste management* has been detailed out in

a separate subchapter, having an important role in assessing the human-induced changes in relation with the urban sprawl phenomenon. A special attention is attributed to *natural hazards* (geological, geomorphological and soil, climatic and hydrological) and *technological hazards* (related to radioactive substances, related to accidental pollution by oil and other hazardous substances, biological, pollution induced by damaged hydrotechnical constructions).

The last chapter of the book addresses the two sub-principles of sustainable development that can be applied in order to diminish environmental change, human impact, uncontrolled urban sprawl and to support environmental protection. *Transport and environmental infrastructure*, as well as *sustainable agriculture* have also been included in this category. In this regard, emphasis was placed on the development trends of metropolitan transport at European, national and regional level. In addition, the EU pre-accession programs that concurred to the modernization of the Bucharest Metropolitan Area have been considered. Other possible actions designed to use, in a sustainable manner, the area under analysis (organic farming, environmental rehabilitation, etc.) have been added.

The main requirement in assessing human impact upon the environment is to combine all the outcomes with respect to each environmental element into a joint and coherent assemblage in order to emphasize with accuracy the causal relationships between geographical processes and phenomena. Additionally, these complex interactions should comprise the spatial and temporal hierarchy, the main features, the evolution trends on a short, medium and long term, the vulnerability degree to different natural hazards and the favourability to different activities which could increase the use of resources without causing related imbalances. In this volume, Ines Grigorescu succeeds in integrating all these aspects, delineating the critical environmental areas as a major result of this assessment which highlights the synergic effects of the interrelationships between the environmental components, thus having a direct projection upon the city's spatial and socio-economic dynamics.

The author proves good GIS skills which allowed her to introduce relevant graphical representations. Therefore, several unique maps were produced applicable not only to the Bucharest Metropolitan Area, also to other geographical units. The work elaborated by Ines Grigorescu stands for a model of approach to any metropolitan area or geographical unit.

Monica Dumitrașcu