IMPORTANCE OF THE LOCAL TERRITORIAL LEVEL IN SHAPING THE QUALITY OF EMPLOYMENT PATTERNS IN ROMANIA

IRENA MOCANU*

Key-words: quality of employment, local territorial levels, Romania.

Abstract. Since the quality of employment has become the focus of attention among labour market analysts, policy makers, the researchers from many and diverse filed of sciences, the geographers included, are interested in studying this concept. The paper aims to emphasize the contribution of the local territorial level in setting up the quality of employment in Romania. Methodological aspects are discussed with focus on construction and computation of the so-called "index of the characteristics related to the quality of employment" (ICQE) which is considered at five territorial levels (national, macro-regional, regional, county and local). The largest part of the paper presents the analysis results, basically the spatial distribution of the quality of employment patterns at different territorial levels focusing on the role held by the local territorial level in shaping the spatial features of quality of employment. The study concludes that the local territorial level revealed the very low quality of employment pattern, which is hidden at macro-regional, regional and county levels.

1. INTRODUCTION

The broad field of employment is diverse and complex and is under constant development and reinvention (Townsend and Wilkinson, 2011). Employment represents a central element for the life of people, even the economists thinking that this importance consists not only in terms of time and providing income but in terms of influence on quality of life (Stiglitz *et al.*, 2009). The employment is the key to social and economic advancement and it provides identity to people and, at the same time, quality of employment influences in an important way the quality of life, employment being not without risk (*Statistical framework for measuring quality of employment*, 2012).

Since the quality of employment is an issue of importance to individuals, national and international institutions, governments etc, this concept has increasingly becomes the focus of attention among labour market analysts, researchers, policy makers in the European Union and worldwide. Decent work, quality of work, quality of working life, job quality, good jobs and bad jobs are the most important concepts related to the "quality of employment" (Sen, 1997, ILO, 1999, Clark, 2000, van Bastelaer, 2000, 2002, Johri, 2005, Burchell *et al.*, 2012). Among these, the concept of job quality appears to be important for our approach because, conceptually, it may be useful to divide it into two broad areas: quality of employment and quality of work. Quality of work focuses on the way in which the activity of work itself and the conditions under which it takes place can affect the well-being of workers (e.g. social environment, physical environment) (Contreras *et al.*, 2009). Quality of employment covers all the elements related to the employment contract, remuneration and working hours and career development. The quality of employment is defined as a set of characteristics that determine the capability of employment to satisfy certain commonly accepted needs (Van Bastelaer and Hussmanns, 2000). Over the last decades a vibrant body of research committed to investigating the concept of quality of employment (e.g. Herod, 1997, 2007, Harvey, 2001, Greenhaus *et al.*, 2003,

* Senior researcher, Institute of Geography, Romanian Academy, 12 Dimitrie Racoviţă Street, 023993, Bucharest, RO-023993, mocanitai@yahoo.com.

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Sehnbruch, 2004, Moretti, 2004, Andren, Martison, 2006, Gallie, 2007, Davoine *et al.*, 2008, Ferrante, 2009, Castree *et al.*, 2004, Castree, 2010). Territorially, the labour market, work, employment and quality of employment must be understood in the context of global production networks (Ellem, 2006). Worldwide, this type of approaches incorporates the geographical dimension as a central dynamic element (Herod *et al.*, 2001, Peck 1996, 2003, Martin 2000, Martin and Morisson 2003, Castree 2010, Weller and Campbell 2014).

Ever since the beginning of the 20th century, the idea that the labour market has an intrinsically local or spatially constituted level of operation and regulation (Allen and Henrg, 1977 quoted by Martin and Morisson 2003) was present in the Romanian social geography. In his work "Un proect de geografie socială a Romîniei"/"A Project on Social Geography in Romania" (*Buletinul SGR*, XXIII, I, 1902, Bucharest), Nestor V.A. Urechia proposes a study on the "work done by the head of the family and the family members" (p. 98) with focuses on the object of work, propensity for work, work-place, the tasks involved by work, organisation of labour, wages, social protection of working families, etc. Before December 1989, the Romanian geographical literature included labour studies with highlight on their quantitative and structural features, but never on the quality of employment or unemployment. Studies on the geographical dimension of the social phenomena, inclusive of the structure of employment and unemployment became ever more numerous in the post-December period (Cocean *et al.*, 1996, Popescu, 2001a) and b), 2003, Iaţu, 2002, Ipatiov, 2007, Ianoş and Heller, 2006, etc.).

The study of quality of employment is timely coming at a period when global labour markets are undergoing large scale changes in their form and composition (Janoski *et al.*, 2014). The economic crisis that led to recession worldwide in 2008–2009 impacted in multiple ways on work and economic life (Warren, 2015). In Romania, the beginning of the crisis (in the last trimester of 2008) was not accompanied by adequate measures to at least attenuate its economic and moreover social effects (Radocea, 2009). It was „a catastrophe with a negative impact on the economic development programmes and particularly on the growth of incomes for the present generations of employees" (Fota and Băcescu, 2009, p. 5).

In this study, the quality of employment assessment will be made by closely analysing the main features of employment at a micro-scale level (local administrative units – LAU). The process, phenomena and factors with an important role in designing the structure and functions of the territory (among other things, these being the outcome of labour market characteristics) can be identified at a local level, as a characterization of perceived influence, not physical measurable but it is what people accept it to be (Zermoglio *et al.*, 2003). The micro-scale is considered the spatial category allowing the most detailed analysis of the main processes taking place within nature and society, it "is the place where everything happens" (Ianoş and Popescu, 1997, pp. 41).

The aim of this paper is to analyse the importance of the local territorial level in setting up the quality of employment in Romania, objective which implies the assessment of the quality of employment from a multi-scales approach (national, macro-regional, regional, county and, finally, local level). The temporal dimension was selected to mirror the negative effects of the economic crisis and, simultaneously, to valorize the statistical data available at all territorial levels mentioned, provided by the Population and Housing Census (National Institute of Statistics). This moment is represented by the year 2011. Thus, the study is divided in two different parts: first one includes the identification of the statistical variables and indicators for measuring the quality of employment (available at all different territorial analysed); second one represents the assessment of the quality of employment at spatial levels analysed. Finally, how the spatial patterns of quality of employment changed from national down to regional and local territorial levels will be analysed. Specifically, the paper examines how the spatial patterns of quality of employment are changed once the analysis is extended to the local level, emphasizing the existence of very low quality of employment at this territorial level.

2. STATISTICAL MEASUREMENT OF QUALITY OF EMPLOYMENT: GENERAL ASPECTS

Many international organisations emphasise the importance of quality of employment in their work (e.g. International Labour Organization, UNECE, European Foundation for the Improvement of Living and Working Conditions). Establishing the principles for the statistical framework represents the first step of the elaborated process of measuring the quality of employment: the indicators of quality of employment should be organised in a transparent and logical structure; all indicators should have a clear relationship with quality of employment; the indicators should be sufficiently broad to allow a maximum choice for countries; the indicators should be developed, wherever possible, using international recommendations and guidelines on classifications, concepts, definitions and computation methods and definitions; the indicators should be those for which National Statistical Offices find appropriate in providing the data (Lozano, 2005, Cloutier, 2008, Muñoz de Bustillo *et al.*, 2011, *Statistical framework for measuring quality of employment*, 2012). The next step is to define the dimensions and sub-dimensions of the framework, which varies a lot worldwide. At international and EU levels, in developing the framework of statistical indicators for measuring the quality of employment three approaches are in use. The International Labour Organization's (ILO) have developed several indices and systems of indicators of „decent work" as follows: Ghai (2003) uses the variables in order to account for the employment, social security, workers' rights and the social dialogue dimensions; Bonnet *et al.* (2003) operate with seven different dimensions of security: labour market, employment, job, work, reproduction of skills, income and representation; Anker *et al.* (2002) propose a set of indicators based on aggregate data referring to eleven group of indicators (e.g. employment opportunities; unacceptable work; adequate earnings and productive work; stability and security of work; fair treatment in employment; social protection and social dialogue); Bescond *et al.* (2003) proposed an index which is based on seven indicators (e.g. the child non-enrolment rate, the share of low-paid workers (with earnings lower than 50% of the median), the unemployment rate, the youth unemployment rate, the male-female gap in labour force participation rates). The second approach on measuring the qualitative aspects of employment is due to the European Commission Quality of Work Indicators and Eurostat (EU statistics on labour force survey (EU-LFS) as core data source). They have defined a set of indicators to monitor quality of employment (indicators endorsed at the Laeken European Council in December 2001). The so-called "Laeken indicators" comprise ten dimensions of quality of employment (e.g. lifelong learning and career development, gender equality, inclusion and access to the labour market, work organisation and the work– life balance, diversity and non-discrimination and overall economic performance and productivity) (*Employment in Europe*, 2008). The "Laeken indicators" include 26 indicators. The third approach is due to the European Foundation for the Improvement of Living and Working Conditions (Eurofound) which has identified three perspectives on the quality of work and employment (societal, corporate and individual). The proposed 62 indicators are primarily designed to measure quality of employment from the perspective of the individual or worker (*Measuring Quality of Employment*, UNECE, 2010).

It is very important to identify how to use these numerouse indicators. At the national level, the indicators can be used to identify labour market trends, the indicators are especially useful to identify groups with less favourable labour market situations and many different sub-populations could be considered in this context (sex, age categories, ethnic minorities, level of educational attainment, persons with a disability); a possible application of the indicators would be to use it to compare the quality of employment in different sectors of economic activity; another important comparison would be made between different categories of employed persons (the status in employment – employees, employers, own-account workers, contributing family workers) (*Potential indicators for measurement of quality of employment*, 2010).

3. ASSESSMENT OF THE QUALITY OF EMPLOYMENT: METHODOLOGICAL ASPECTS

It can be noted that all the possibilities to use the indicators mentioned above do not include the spatial dimension: the comparisons could be made between different groups or sub-populations, between different sectors of economic activity etc. but they not could be made between different territorial levels The main criticism of this international framework of statistical indicators is that they rarely applied in practice at micro-scale level (Johri, 2005). The cause consists in the fact that the indicators and indexes are constructed from statistical data measured at macro-level. Reviewing the existing job quality/employment quality indicators, results the conclusion that at EU level is still a need a worker-oriented, individually constructed and scientifically grounded job quality/employment quality indicator in order to measure, compare and monitor job and employment quality in the different Member States (Contreras *et al.*, 2009).

For measuring the quality of employment at different territorial levels, the international framework of statistical indicators should be supplemented by additional ones, resulted from the rule of availability concomitantly at national, macro-regional, regional, county and local levels (Davoine *et al.*, 2008). In this study, the main criteria for selecting statistical indicators to measure the quality of employment were their relevance to the Romanian labour market and the availability at all the different territorial levels considered in this analysis.

Two studies (Sehnbruch, 2004, Ciutacu and Chivu, 2007) have revealed that there are some indicators which might reflect the quality of employment at all territorial levels, at the same time meeting both the relevance for Romania, as well as the availability at all the different territorial levels. These indicators are: general rate of employment (EMPLOY), rate of unemployment (UR), rate of employment in agriculture (EMPLOYAGR), rate of employment in non-agricultural activities (divided into manufacturing sector – EMPLOYMANUF and tertiary sector – EMPLOYTERT) and the % of employees per total employed population (EMPLOYEES) (Mocanu, 2015). In our study, these indicators are computed from the statistical data available at macro-regional, regional, county and LAU2 levels provided by the National Institute of Statistics (TEMPO Online and the results of the Population and Housing Census, 2011).

The attributes of the quality of employment were synthesised into a complex index, the so-called "index of the characteristics related to the quality of employment – ICQE" (adapted from Sehnbruch, 2004), calculated as arithmetic mean (Arvigan *et al.*, 2005) between the relative distance to the national average for the territorial unit "*i*". With this methodological approach, the indicators selected for measuring the quality of employment are adapted to the purpose of the multi-level analysis, and compared to a common reference point (Goschin *et al.*, 2008), which is represented in this study by the national average of each statistical indicator selected.

D_{EMPLOY} = EMPLOY*i* / EMPLOY*nav*

$D_{EMPLOYMANUF}$ = EMPLOYMANUF*i* / EMPLOYMANUF*nav*

$D_{EMPLOYTERT}$ = EMPLOYTERT*i* / EMPLOYTERT*nav*

$D_{EMPLOYEES}$ = EMPLOYEES*i* / EMPLOYEES*nav*,

where:

– D_{EMPLOY}, $D_{EMPLOYMANUF}$ and $D_{EMPLOYTERT}$ are the relative distances of the general rate of employment, the rate of employment in the manufacturing sector, the rate of employment in the tertiary sector and $D_{EMPLOYEES}$ is the relative distance of the share per employees of the total employed population;

– EMPLOY*i*, EMPLOYMANUF*i*, EMPLOYTERT*i* and EMPLOYEES*i* are the values of the selected indicators in the territorial unit "*i*";

– EMPLOY*nav*, EMPLOYMANUF*nav*, EMPLOYTERT*nav* and EMPLOYEES*nav* are the national average values of the selected indicators.

The indicators "unemployment rate" and "rate of employment in agriculture" offer a different perspective on the quality of employment; unlike the other four indicators, the lower the unemployment rate and the rate of employment in agriculture, the better the quality of employment in a territorial unit. So, in the case of these two statistical indicators, the relative distance to the national average for the territorial unit "*i*" is adapted to this particularity by inverting the fractions:

D_{UR} = Ur*nav* / UR*i*

$D_{EMPLOYAGR}$ = EMPLOYAGR*nav* / EMPLOYAGR

where:

– D_{UR} is the relative distance of the unemployment rate and $D_{EMPLOYAGR}$ is the relative distance of the rate of employment in agriculture;

– UR*i* and EMPLOYAGR*i* are the values of selected indicators in the territorial unit "*i*";

– UR*nav* and EMPLOYAGR*nav* are the national average values of selected indicators.

ICQE = (D_{EMPLOY} + $D_{EMPLOYMANUF}$ + $D_{EMPLOYTERT}$ + $D_{EMPLOYEES}$ + D_{UR} + $D_{EMPLOYAGR}$)/6 (Arvigan *et al*., 2005).

The INQE values above unity indicate high quality of employment (1.001 – 2.99 = medium-high, 3.00 – 5.99 = high and 6.00 – 20.68 = very high) in differente macro-regions, regions, counties or LAU2, while the values below unity point show the territorial units with low or very low quality of employement (0.500 – 0.99 = low and 0.289 – 0.49 = very low) (Figs. 1, 2, 3 and 4). All six indicators are equally weighted in the final index (ILO, 1999) and the resulting quality of employment patterns are: very low, low, medium-high and high.

4. RESULTS

National level. Once Romania joined the EU (2007), the country was included in the studies focused on employment in EU and the negative social and economic effects of the transitions period have reflected by these. Among the four employment quality systems in the EU (*Employment in Europe 2008*, Davoine *et al.*, 2008), one that is specific to Romania implied low productivity levels, low socio-economic security and unfavourable working conditions (e.g. high health risks), which are partly offset by the relatively low work intensity. Once the financial and economic crisis set on (2008), the growth rate of unemployment and the number of unemployed recorded a tendency to close to the situation existing at the end of the 1990s. One of the effects of the economic-financial crisis was the rise of unemployment throughout the country. At the same time, the crisis revealed the fragility of employment in some industrial (sub)branches known for almost explosive development prior to recession (e.g. car parts, garments, etc.), which, in the new global conditions, had to restructure or slow down their activities. In the counties that had a high unemployment rate and a low occupancy rate even before the crisis, imbalances in the regional or local labour markets became more acute (Mocanu, 2010).

At macro-regional level, there are two quality of employment patterns: low and medium-high (Fig. 1).

The macro-regions I, II and IV, which formed the low quality of employment pattern, yielded statistical indicators values with positive effect on the above-analysed index of the national average; the values of unemployment rate and of employment rate in agriculture, with negative impact on the quality of employment level, are below the baseline. Of these three macro-region, the Macro-region I is the only which registered a value of the computed index (0.944) very close to the unity (or to the baseline), which would indicate the medium-high quality of employment pattern. Macro-region II records the lowest value of ICQE (0.787), registering a problematic quality of employment. Macro-region III, which includes Bucureşti–Ilfov region, stands for the medium-high quality of employment pattern. In this macro-region, the general employment rate, the percentage of employees per total employed population and the rate of occupancy in non-agricultural activities have high values; at the

same time, the values of unemployment rate and employment in agriculture values are below the national average.

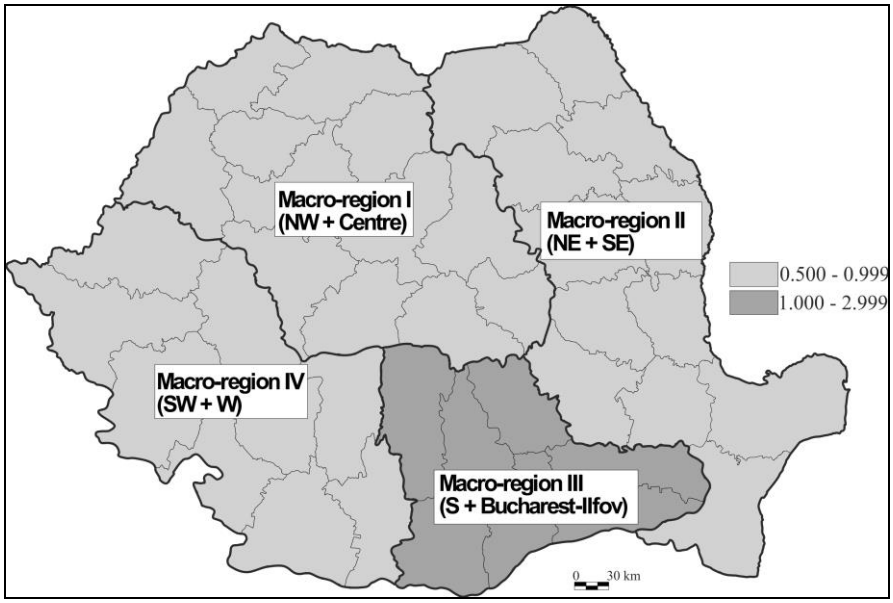

Fig. 1 – Index of the characteristics related to the quality of employment (ICQE) at macro-regional level. (*Source*: processed and mapped statistical data provided by the Population and Housing Census 2011, TEMPO Online, National Institute of Statistics).

The whole range of economic and socio-cultural changes is better perceived at regional level because this level can offer a better image of the whole (Ianoş, Popescu, 1997). At regional level, the quality of employment and of unemployment is influenced by current economic mechanisms and the legacy of an economic and social system specific to each region, of production factors and the sectoral structure of economic activities. The regional job-market is an intermediate entity between the national and the local markets, sectoral structure being the outcome of both market opening and the ever greater regional disparities in the development process (Bourdeau-Lepage, 2000). The quality of employment and the unemployment are a part of regional labour markets.

The eight regions of development are included in the same two quality of employment patterns as macro-regions are: low and medium-high (Fig. 2).

The North-East, South-East, South and South-West regions form the low quality of employment pattern, they having registered the following differences in terms of the indicators selected: comparing with the baseline, unemployment and occupancy in agriculture are higher, the general employment and the share of employees per total employed persons are lower; the structure of the employed population by economic activity sectors is different, but negative compared with Romania's structure (the manufacturing and tertiary sectors employ fewer persons than the national average).

The medium-high quality of employment pattern includes the Centre, West, North-West and Bucureşti–Ilfov development regions. These regions registered the highest values of indicators with a positive effect on the quality of employment and lowest values of indicators with a negative effect, a situation particularly evident in Bucharest–Ilfov region. In these regions, the general rate of employment, employment in non-agricultural activities and the percentage of employees registered higher values than the national average, Bucharest–Ilfov region having the lowest score for unemployment rate and occupancy in agriculture (2.7% and 3%), with the highest record for employment in tertiary activities and the percentage of employees per total employed population (70% and 74.4%, respectively).

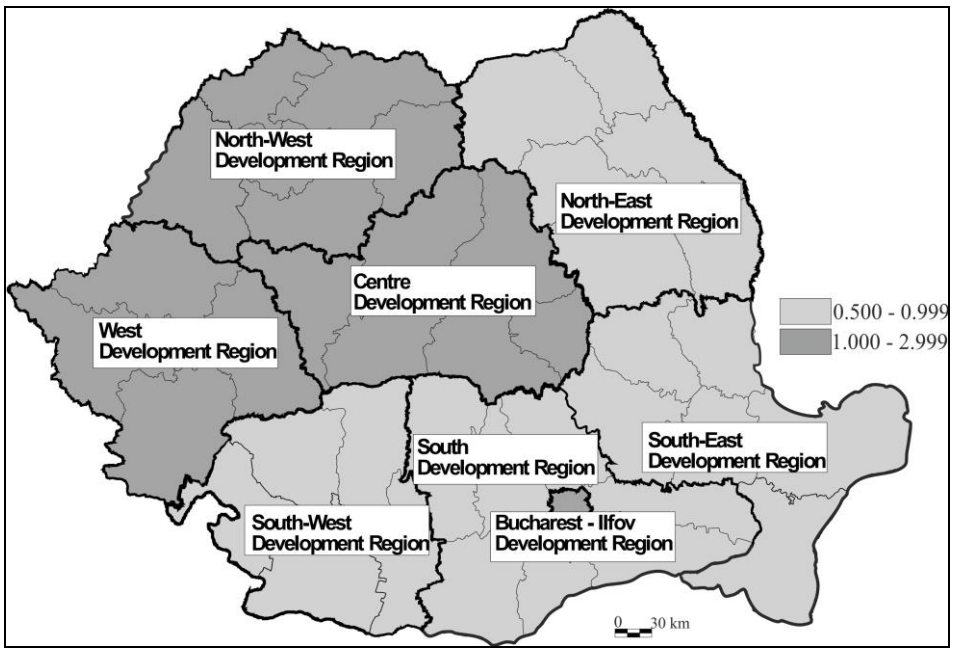

Fig. 2 – Index of the characteristics related to the quality of employment (ICQE) at regional level. (*Source*: processed and mapped statistical data provided by the Population and Housing Census 2011, TEMPO Online, National Institute of Statistics).

The county level has three quality-of-employment patterns: low, medium-high and very high (Fig. 3).

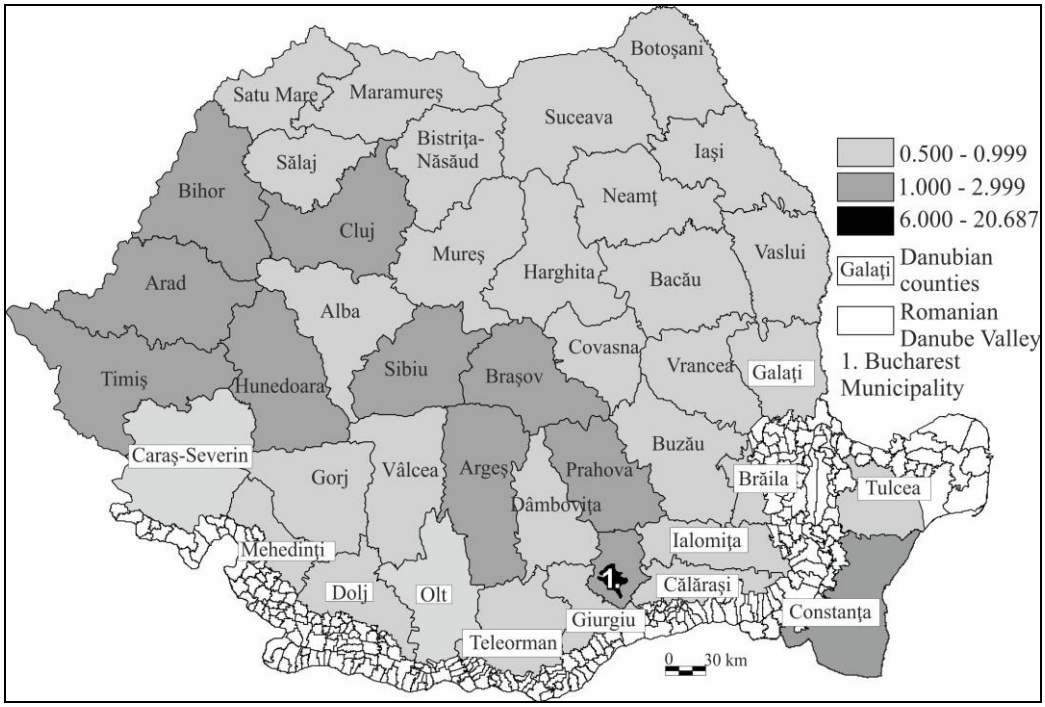

Fig. 3 – Index of the characteristics related to the quality of employment (ICQE) at county level. (*Source*: processed and mapped statistical data provided by the Population and Housing Census 2011, TEMPO Online, National Institute of Statistics).

The very low quality-of-employment pattern, exists in the majority of Romania's counties (31), and is scattered all over the regions. The counties from the eastern, south-eastern and southern parts of Romania fall into the very low quality-of-employment pattern. All across the Centre, West and North-West development regions had a medium-high quality-of-employment pattern, but in some counties this pattern was very low, indeed. In fact, only two counties in each of the North-West and Centre regions, have the same medium-high quality-of-employment pattern like the region they belong to (Bihor and Cluj in the North-West region and Sibiu and Braşov in the Centre region), the other eight counties of these two regions having a very low quality of employment pattern. In the West region, only Caraş-Severin County has this pattern, the other three counties of the region falling into the medium-high pattern. This pattern also is represented in the south and south-eastern parts of Romania (Argeş, Prahova, Ilfov and Constanţa). Bucharest Municipium stands out with a very high quality of employment, being a singular case among an extended pattern of very low quality of employment, in which some discontinuous areas of medium-high quality can also be detected.

Some Social Geography researchers view the local level as a true laboratory, or as a socio-"geographical melting pot" which reproduces social relationships in terms of the geographical space (Chevalier, 1986). Apart from its area proper, it encompasses lots of local places of variables size, depending on one another, and on which outside evolutions impose certain rates of a special dynamics.

In this study, the local level is represented by the 266 local administrative units of the Romanian Danube Valley (Fig. 4).

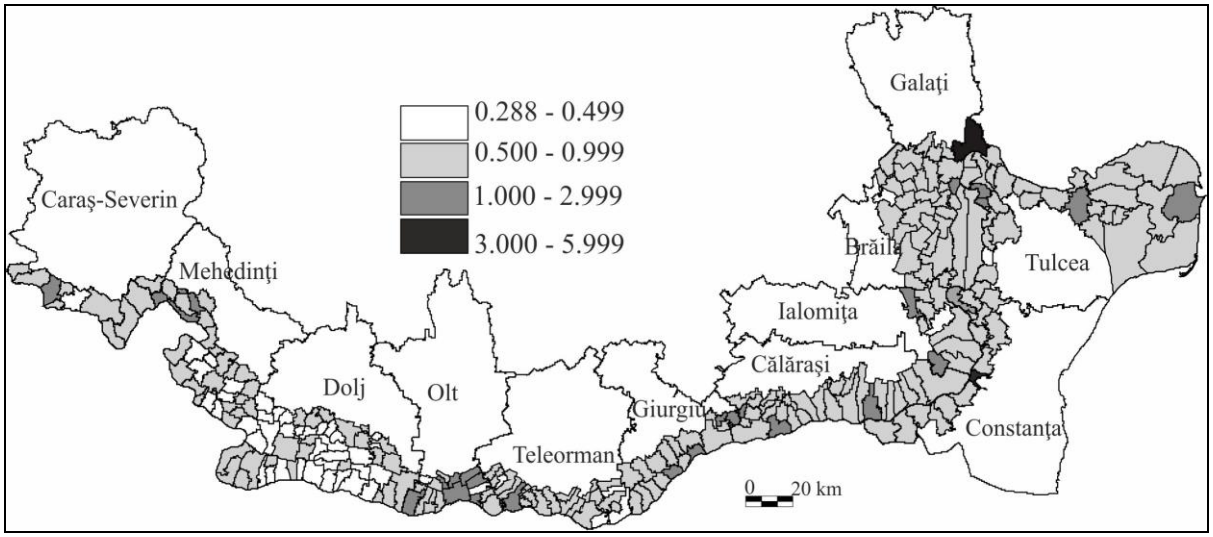

Fig. 4 – Index of the characteristics related to the quality of employment (ICQE) at local level.
(*Source*: processed and mapped statistical data provided by the Population and Housing Census 2011, TEMPO Online, National Institute of Statistics).

Out of the 12 Danubian counties, Constanţa alone falls into the medium-high quality of employment pattern, in the other 11 counties this pattern is low. The Valley's labour market in 2011 looked unbalanced because of disequilibrium between the quantitative and structural characteristics of labour: activity and employment rates had low and very low values (44.3% and 62.8%, respectively); the labour-force substitution index being sub-unity (population aged 15–29/ population aged 30–44 = 0.71) was an indication that the labour potential was incapable of maintaining its demographic and productive vigour. Comparing with the national average values, the unemployment rate (8.5%), the occupancy rate in agriculture (33.6%), the economic dependency rate (136%) and the inactivity rate were high and/or very high.

In terms of the quality of employment territorial patterns, what distinguished the Romanian Danube Valley were the following aspects:

– the very low quality of employment pattern included 47 rural LAU2, which numbered 53,894 economically active persons. These rural settlements registered high general employment rate values (due to the 80% – 90% occupancy in agriculture) and a high rate of unemployment (most values being above the baseline, with a maximum value in the Romanian Danube Valley, at Gârla Mare, Dolj County – 23.4%). Geographically speaking, this quality of employment pattern is concentrated in the western part of the Valley, especially in Dolj and Mehedinţi counties;

– the low quality of employment pattern comprised 190 rural and urban Danubian LAU2 with 283,687 economically active persons, concentrated especially in the eastern part of the Valley, and scattered in its western part, that is in some rural settlements and small towns of Dolj and Mehedinţi counties (e.g. Calafat, Băileşti and Vânju Mare).

These first two quality of employment patterns cover 89% of total Danubian LAU2 and almost 50% of all of the Romanian Danube Valley economically active population, characteristic features being the general employment rate, the employment rate in the manufacturing and tertiary sectors and the share of employees per total employed population, which registered values below the baseline. In the localities included in these two quality of employment patterns, employment in agriculture and the unemployment rate had high and very high values, above the national average.

The medium-high quality of employment pattern covers of 27 LAU2 which cumulate almost 40% of the total economically active Valley population. This pattern includes rural and urban settlements in which the share of employment in the manufacturing and the tertiary sectors was close to the national average. In those LAU2, occupancy in agriculture was no longer so high as in the localities from the first two patterns, but maximum values still ranged between 7080% (in some rural settlements located in the Olt and Giurgiu counties). The medium-high level of this indicator grouped important Danubian municipia (e.g. Brăila, Drobeta-Turnu Severin, Tulcea, Giurgiu and Călăraşi), as well as some of the small town-ports (e.g. Orşova, Moldova Nouă and Măcin).

The high quality of employment pattern covers only two Danubian large municipia: Galaţi and Cernavodă, which register low employment values in agriculture, a high share of employees per total employed population and a high percentage of employment in the manufacturing and tertiary sectors; the unemployment rate is above the baseline.

5. CONCLUSIONS

The quality of employment index registered a geographical values distribution in terms of distinct territorial level considered. Generally speaking, the macro-regional and regional levels hide quality of employment territorial differences. In Table 1, this reality is mirrored by two obvious aspects: firstly, Romania`s four macro-regions and the eight development regions are divided only into two quality of employment patterns (low and medium-high) and secondly, their component counties are divided in three patterns (low, medium-high and very high). Moreover, an analysis at local level in the Romanian Danube Valley shows that the number of quality of employment patterns increases to four (very low, low, medium-high and high).

The very low quality of this pattern appears only in the local level analysis, and not at macro-regional, regional and county levels. In fact, the way in which the spatial patterns of job quality are changed once the analysis is extended to the local level is illustrated by analysing the Danubian "domain". The macro-regions II, III and IV, which the Romanian Danube Valley belongs to, are part of the low and medium-high quality of employment patterns. Macro-region III represents the medium-high quality of employment due to the Bucharest–Ilfov development region, which is not part of the

Danubian "domain". Also, the analysis of the Danubian development regions shows the same two quality of employment patterns: low and medium-high. The situation is similar to the macro-regional level: the medium-high pattern, registered by the West region, is due to the counties of Timiș, Arad and Hunedoara, which are not inside the Danubian "domain". The local territorial level of analysis revealed the very low quality of employment pattern, which is hidden at macro-regional, regional and county levels.

Table 1

Synthetic outline of different territorial levels in terms of quality of employment patterns.

ICQE values/ quality of employment pattern	**Macro-regional level**	**Regional level**	**County level & Bucharest Municipality**	**Local level (Romanian Danube Valley)**
0.289 – 0.499 = very low *(EMPLOY, EMPLOYMANUF, EMPLOYTERT and EMPLOYEES registered values below the baseline; EMPLOYAGR and UR registered high and very high values, above the baseline)*	–	–	–	47 LAU2
0.500 – 0.999 = low (*EMPLOY, EMPLOYMANUF, EMPLOYTERT and EMPLOYEES have values above of the national average*; *EMPLOYAGR and UR are below the national average)*	3 MACRO-REGIONS: I, II and IV	4 development regions:N–E, S–E, S–W and S	31 counties	190 LAU2
1 = baseline (*the national averages of each indicator)*				
1.001 – 2.999 = medium-high (*highest values of EMPLOY; EMPLOYMANUF, EMPLOYTERT and EMPLOYEES are close to the baseline; low values of EMPLOYAGR and UR*)	1 MACRO-REGION: III	4 development regions: Bucharest–Ilfov, Centre, W and N–W	10 counties	27 LAU2
3.000 – 5.999 = high *(low values of EMPLOYAGR, EMPLOYEES; high values of EMPLOYMANUF and EMPLOYTERT; UR is above the baseline)*	–	–	–	2 LAU2
6.000 – 20.687 = very high *(the lowest values of EMPLOYAGR and UR; the highest values of EMPLOYEES, EMPLOYMANUF and EMPLOYTERT)*	–	–	Bucharest Municipality	–

(Source: author`s compilation)

This conclusion is sustained by the average values of the index of characteristics related to the quality of employment (ICQE), computed for each territorial level discussed and, separately, for the so-called Danubian "domain" (Fig. 5). The general data show an increasing trend, from the low pattern registered at macro-regional level (ICQE = 0.925) to the medium-high pattern, specific to regional (ICQE = 1.221) and county (ICQE = 1.420) levels. The analysis of the Danubian "domain" revealed an average ICQE values fall with decreases at territorial levels: ICQE = 0.919 in the Danubian macro-regions and ICQE = 0.734 in Romanian Danube Valley. This last average value shows that the Romanian Danube Valley as a whole belongs to the low-quality of employment pattern. In fact, this average value hides the minimum values of the index, but also the medium-high and high ones.

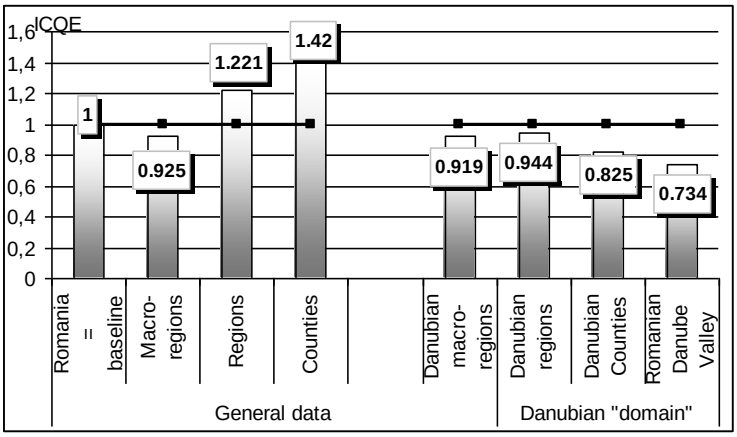

Fig. 5 – Index of the characteristics related to the quality of employment (ICQE) – average values of each territorial level. (*Source*: author's compilation).

Exploring the role of local territorial level in shaping the quality of employment is a difficult matter, because whenever at national level, this index is increasing, it may simultaneously decrease and increase at regional or local levels. The local territorial level emphasises the very low quality of employment patterns, which is hidden at macro-regional, regional and county levels; in the reverse situation, the macro-spatial analyses conceal and distort the dynamics and modelling employment quality indicators at lower territorial levels. Therefore, only a synthesis at national level of the regional and local trends is far too superficial and, having in view the impact of employment quality on the area, on communities and individuals, the importance and necessity for local studies becomes obvious.

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REFERENCES

Andren, D., Martinsson, P. (2006), *What Contributes to Life Satisfaction in Transitional Romania?*, Review of Development Economics, **10**, *1*, pp. 59–70.

Anker, R., Chernyshev, I., Egger, Ph., Mehran, F., Ritter, J. (2002), *Measuring Decent Work with Statistical Indicators*, Inernational Labour Review, **142**, *2*, Geneva, pp. 147–178.

Arvigan, T.; Bivens, L. J., Gammage, S. (eds.) (2005), *Good Jobs, Bad Jobs, No Jobs: Labor Markets and Informal Work in Egypt, El Salvador, India, Russia, and South Africa*, Washington, D.C., Economic Policy Institute.

Bastelaer Van, A., Hussmanns R. (2000), *Measurement of the Quality of Employment*, Joint Eurostat and International Labour Office Seminar, Geneva.

Bastelaer van, A. (2002), *Work organisation, a dimension of job quality: Data from the ad hoc module of the 2001 labour force survey in the EU*, Joint UNECE-Eurostat- International Labour Office Seminar on Measurement of the Quality of Employment, Geneva.

Bescond, D., Châtaignier, A., Mehran, F. (2003), *Seven indicators to measure decent work: An international comparison*, International Labour Review, **142**, *2*, pp. 179–212.

Bonnet, F., Figueiredo, J. B., Standing, G. (2003), *A family of decent work indexes*, International Labour Review, **142**, *2*, pp. 213–238.

Burchell, B., Sehnbruch, K., Piasna, A., Agloni, N. (2012), *The Quality of Employment in the Academic Literature: Definitions, Methodologies, and Ongoing Debates*, Working Paper, *1*, Centre for New Development Thinking, London.

Castree, N. (2010), *Workers, economies, geographies*, in McGrath-Champ, S, Herod, A. Rainnie, A, (eds), *Working Space: Handbook of Employment and Society.* Edward Elgar, Cheltenham, pp. 457–76.
Castree, N. Coe, N., Ward, K., Samers, M., (2004), *Spaces of Work: Global Capitalism and Geographies of Labour*, Sage, London.
Chevalier, J. (1986), *De l'importance de l'échelle dans l'élaboration des questionnements en géographie sociale*, Contribution au coloques de géographie sociale de Caen.
Ciutacu, C., Chivu, L. (2007), *Calitatea muncii şi a ocupării forţei de muncă în România***,** National Institute of Economic Research, European surveys on working conditions, European Foundation for the Improvement of Living and Working Conditions, http://www.eurofound.europa.eu/sites/default/files/ef_files/pubdocs/2007/37/ro/1/ef0737ro.pdf.
Clark, D.A. (2000), *Capability and Development, An Essay in Honour of Amartya Sen*, Working Paper 39, University of Lincolnshire and Humberside.
Cloutier, L. (2008), *La qualité de l'emploi au Québec, développements conceptuels et création d'une typologie. État actuel de la réflexion*, Institut de la statistique du Québec.
Cocean, P., Rotar, Gabriela, Ipatiov, F. (1996), *Geografia socială-ramură de bază a geografiei umane,* Studii şi cercetari de geografie, t. XLIII, Romanian Academy, Bucharest.
Contreras, R., Muñoz de Bustillo, R., Fernández-Macías, F., Antón, J. I., Esteve, I. (2009), *Indicators for Job Quality in European Union*, Directorate-General for Internal Policies, Employment, Social Affairs, Brussels.
Davoine, L., Erhel, C., Guergoat-Lariviere, N. (2008), *Monitoring quality in work: European Employment Strategy indicators and beyond***,** International Labour Review, **147**, *2–3*, pp. 163–198.
Ellem, B. (2015), *Geographies of the labour process: automation and the spatiality of mining*, Work Employment & Society, September, **18**.
Ferrante, F. (2009), *Education, Aspirations and Life Satisfaction*, Social Science Research Network, Kyklos, **62**, *4*, pp. 542–562.
Fota, D., Băcescu, M. (2009), *Criza economică din România anului 2009 – cauză, efecte, soluţii,* Ed. Universitară, Bucharest.
Gallie, D. (2007), *Production Regimes and the Quality of Employment in Europe*, Annual Review of Sociology, **33**, pp. 85–104.
Ghai, D. (2003), *Decent work: Concept and indicators*, International Labour Review, **142**, *2*, pp. 113–145.
Goschin, Zizi (2008), *Regional Disparities in Romania*, Romanian Statistical Review, *1*, pp. 71–77, National Institute of Statistics.
Greenhaus, J.H., Collins, K.M., Shaw, J.D. (2003), *The relation between work–family balance and quality of life*, Journal of Vocational Behavior, *63*, pp. 510–531.
Harvey, L. (2001), *Defining and Measuring Employability*, Quality in Higher Education, **7**, *2*, pp. 97–109.
Herod, A. (1997), *From a geography of labor to a labor geography: labor's spatial fix and the geography of capitalism*, *Antipode*, **29**, *1*, pp. 1–31.
Herod, A., Peck, J., Wills, J. (2001), *Geography and industrial relations*, in Ackers, P., Wilkinson, A., (eds), *Understanding Work and Employment*, Oxford University Press, Oxford, pp. 176–192.
Herod, A., Rainnie, A., McGrath-Champ, S. (2007), *Working space: why incorporating the geographical is central to theorizing work and employment practices***,** Work Employment & Society, **21**, *2*, pp. 247–264.
Ianoş, I., Heller, W. (2006), *Spaţiu, economie şi sisteme de aşezări,* Ed. Tehnică, Bucharest.
Ianoş, I., Popescu, Claudia (1997), *Organizarea spaţiului la nivel de microscară*, *Buletin geografic*, **1**, pp. 41–47.
Iaţu, C. (2002), *La géographie du chômage en Roumanie post communsite*, in vol. *Moldova. Populaţia, forţa de muncă şi aşezările umane în tranziţie*, Ungureanu Al., Groza , O., Muntele I. (coord.), Ed. Corson, Iaşi.
Ipatiov, F. (2007), *Geografie socială,* "Babeş-Boliay" University, Faculty of geography, Cluj-Napoca.
Janoski, T. Luke, D., Oliver, O. (2014), *The Causes of Structural Unemployment: Four Factors That Keep People from the Jobs They Deserve*, Polity Press, London.
Johri, R. (2005), *Work values and the quality of employment: A literature review*, http://www.dol.govt.nz/%5Cpdfs%5Clit-review-work-values.pdf.
Lozano, Esteban, (2005), *Quality in work: Dimensions and Indicators in the Framework of the European Employment Strategy*, UNECE/ILO/Eurostat Seminar on the Quality of Work, , May 11 to 13, Geneva.
Martin, R. (2000), *Local labour markets: their nature, performance, and regulation*, in Clark, G., Feldman, M. and Gertler, M., (eds.), *The Oxford Handbook of Economic Geography*, Oxford University Press, Oxford, pp. 445–76.
Martin, R., Morisson, Ph. (2003), *Geographies of labour market inequality*, Routledge, London.
Mocanu, Irena (2010), *Unemployment in Romania during the current economic-financial crisis. Territorial particularities*, Revista Română de Statistică, *3*, pp. 48–55.
Mocanu, Irena (2015), *Quality of employment from a geographical perspective. A show case of the Romanian Danube Valley*, Romanian Journal of Geography, **59**, *2*, pp. 129–140.
Moretti, E. (2004), *Estimating the social returns to higher education*, Journal of Econometrics, **121**, *1–2*, pp. 175–212.
Muñoz de Bustillo, R., Fernández-Macías E., Antón, J., Esteve, F. (2011), *Measuring More Than Money – The Social Economics of Job Quality*, Edward Elgar.
Peck, J. (1996), *Work-Place: Tehe Social Reglatio of Labor arkets*, Gilford Press, New York.
Peck, J. (2003), *Places of work*, in Sheppard, E. and Barnes, T., (eds.), *A Companion to Economic Geography*, Blackwell, Oxford, pp. 133–48.

Popescu, Claudia (2001), *Dinamici recente pe piaţa bucureşteană a forţei de muncă,* Revista geografică, **VII**, 2000, Institute of Geography, Romanian Academy, Bucharest.
Popescu, Claudia (2001), *Specializarea industrială şi riscul social în România. Studiu de caz – oraşul textil Buhuşi,* Studii şi cercetări de geografie, **XLVII–XLVIII**, Institute of Geography, Romanian Academy, Bucharest.
Popescu, Claudia (coord.) (2003), *Disparităţi regionale în dezvoltarea economico-socială a României,* Meteor Press, Bucharest.
Radocea, Al. (2009), *România şi criza economică. Puncte de vedere şi propuneri pentru determinarea "Indicatorului echilibrului macroeconomic"*, Revista Română de Statistică, *11*, National Institute of Statistics, Bucharest.
Sehnbruch, K. (2004), *From the quantity to the quality of employment: An application of the Capability Approach to the Chilean labour market*, *9*, Center for Latin American Studies, University of California, Berkeley.
Sen, A. (1997), *Inequality, unemployment and contemporary Europe*, DEDPS, *7*, Suntory and Toyota International Centers for Economics and Related Disciplines, London School of Economics and Political Science, London.
Stiglitz, J. Sen, A., Fitoussi, J.-P., (2009), *Report by the Commission on the Measurement of Economic Performance and Social Progress*, www.stiglitz-sen-fitoussi.fr.
Townsend, K., Wilkinson, A. (eds) (2011), *Research Handbook on the Future of Work and Employment Relations*, Edward Elgar.
Urechia, N. V. A. (1902), *Un proect de geografie socială a Romîniei,* Buletinul SGR, **XXIII**, *I*, Bucharest.
Warren, T. 2015, *Work-time underemployment and financial hardship: class inequalities and recession in the UK*, Work, employment and society, *29*, pp. 191–212.
Weller, S.A., Campbell, I. (2014), *The Geography of Job Quality*, In *Job Quality in Australia*, ed. J. Warhurst, A. Knox., Federation Press, Sydney.
Zermoglio, M., van Jaarsveld, A., Reid, W.V., Romm, J. (2003), *Millennium Ecosystem Assessment (MEA). Assessment report outline. The Multiscale Approach*, Island Press, World Resources Institute, Washington.
* * * Conference (1999), *Report of the Director-General: Decent work*, 87th Session, Geneva.
* * * Directorate-General for Employment, Social Affairs and Inclusion (2008), *Measuring the quality of employment in the EU*, Employment in Europe 2008, Brussels.
* * * Conference of the European Statisticians (2010), *Potential indicators for measurem ent of quality of employment* (ECE/CES/2010/9), Fifty-eighth Plenary Session, Paris, http://www.unece.org/fileadmin/DAM/ stats/documents/ece/ ces/2010/9.e.pdf.
* * * Directorate-General for Employment, Social Affairs and Inclusion (2010), *Measuring the quality of employment in the EU*, Employment in Europe 2010, Brussels.
* * * European Foundation for the Improvement of Living and Working Conditions (2012), *Eurofound yearbook 2012: Living and working in Europe*, Luxembourg.
* * * Expert Group on Measuring Quality of Employment (2012), *Statistical framework for measuring quality of employment*, https://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.12/2013/Statistical.
* * * National Institute of Statistics, Retrieved Ocrober, 2015, from http://www.insse.ro.

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LES CARPATES ROUMAINES ENTRE L'EXTENSION DU SYSTÈME DE PEUPLEMENT ET LES DÉFIS DE L'ADAPTATION AUX EXIGENCES DE LA MODERNITÉ

IONEL MUNTELE*, ADRIAN GROZAVU**

Mots clés: Carpathes, système de peuplement, population, resilience, modernité.

The Romanian Carpathians between settlement extension and the challenges of adaptation to modernity: The way in which the Romanian Carpathians got populated has aroused much interest, especially from the perspective of the relation between habitat morphology and the development of the systems or of of Transcarpathian settlements flows population correlated with pastoral activities. The aim of this study is to hihglight the secular evolution trends of population, starting from the hypothesis of the existance of some stong specific features of the Carpathian eastern, southern and western areas. The use of some cluster analyses and correlation analyses between the numerical evolution of the population and altitudine, or urbanization degree (closely related to the exploitation of some resources) allowed tha validation of the hypothesis, differentiating the Western Carpathians earlier and more densely populated in the past, both from the Eastern Carpathians, with a rather axial, recently extended population system, and from the Southern Carpathians, whose massiveness caused a peripheral concentration of settlements. The study also emphasizes the tendency of progressive abandonment of unfriendly mountain areas in favour of depressions and valley corridors, as well as the remarkable stability of the rural population during the communist period, as a consequence of the often excessive exlopitation of resources. Consequently, the decline in the economic activities during the post-communist period has brought about a strong population decrease, often significantly above the national level, the depopulation process already affecting large areas especially in the Western Carpathians.

1. INTRODUCTION

Le peuplement des Carpates Roumaines a suscité beaucoup d'intêrét de la part des divers spécialistes. Si les historiens avaient orienté leur intêret vers le débat sur leur rôle de réfuge dans le passé et les antropologues mettaient l'accent sur leur statut de dépositaire des structures sociales ancestrales et des traditions dans leur forme pure, les géographes avaient privilégié surtout l'étude de la morphologie de l'habitat, en étroite liaison avec l'extension du système de peuplement. Il faut aussi noter l'engoument pour les études géomorphologiques, à l'instar des travaux magistraux comme ceux de Emmanuel de Martonne (1902) ou Robert Ficheux (dont la thèse de doctorat soutenue en 1924 à été publiée en 1996), en étroite liaison avec les nombreuses recherches géologiques visant la prospection et l'exploitation des ressources minérales et énergétiques. La fascination exercée dans le monde académique par le milieu carpathique, ressemblent quelque peu et constituant une réverbération de la manifestation plus précoce encore de la même fascination pour l'espace alpin, avait conduit à lui attribuer un statut emblêmatique dans la mythologie moderne nationale. Vue comme „épine dorsale" du territoire roumain ou surnomme „la citadelle carpatique" (dont les contreforts en sont les Subcarpates et les fosses les grands rivières marginales, vision reprise parmi d'autres par André Blanc, p. 16, 1972), voire „le bastion carpatique", ces montagnes ont été intégrées dans le syntagme „carpato-danubiano-pontique", devenue axiome centrale aussi dans l'histoire que dans la géographie du régime d'inspiration soviétique.

* Chercheur, Le Collectif de Géographie, Filiale d'Iaşi de l'Académie Roumaine; Professeur, Faculté de Géographie et Géologie, Université «Alexandru Ioan Cuza», Boul. Carol I, 20 A, 0700507 Iaşi, Roumanie, imuntele@yahoo.fr.

** Professeur, Faculté de Géographie et Géologie, Université «Alexandru Ioan Cuza», Boul. Carol I, 20 A, 0700507 Iaşi, Roumanie, email: adriangrozavu@yahoo.com.

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C'est dans ce siage qu'on avait fixé quelques éléments d'originalité de cette chaîne montagneuse dans un contexte plus large, européen:

– l'altitude moyenne associée à la forte fragmentation conduisant à la fréquence des dépressions et des larges couloirs, particularité favorable à un peuplement précoce;

– la présence de plusieurs niveau d'érosion (plate – formes), favorable au peuplement de la haute montagne (selon des standards carpatiques, c'est-à-dire au-delà de 1 000 m);

– la grande diversité structurale impliquant une variété des ressources minérales et enérgétiques, support supplémentaire d'un peuplement intense et ancien dans certains massifs ou d'une urbanisation parfois avancée, accompagnée d'une industrialisation souvent excessive;

– l'adaptation rémarquable au potentiel naturel spécifique, avec des aménagements du territoire de longue tradition, soit que l'on parle des agrotérasses aménagées sur les versants ou sur les plate – formes ou de l'utilisation pastorale complexe des pâturages alpins (autour de 2 000 m), souvent dans le cadre des diverses forme de transhumance, encore saisisables dans certains massifs (problématique fertile de nombreuses études d'envergure, tel celui de Vuia, 1943);

– la communication facile, issue de la présence de nombreux cols, ensellements, dépressions et larges vallées favorisant la manifestation des flux de peuplement, notamment ceux lié aux activités pastorales (une analyse complexe de ces flux est celle de Meteș, 1977). Ceci malgré le statut partiel de frontière politique avant 1918, mais dans le contexte d'un peuplement majoritairement roumain, surtout dans la haute montagne sans pour cela exclure les mouvements des autres communautés (hongroises, ukrainiennes ou serbo-croates, par exemple).

Une étude susceptible à fournir une vision synthétique du peuplement des Carpates Roumaines n'existe pas. Pourtant, certaines aspects visant des processus et des phénomènes spécifiques ont supporté une analyse approfondie, minutieuse. Parmi les plus remarquables il faut rappeler les travaux de Romulus Vuia sur les communautés et la vie pastorale (1943), ou la grande synthèse géographique proposée par le volume III de l'ouvrage collectif Géographie de la Roumanie (1987). D'un grand intêret sont aussi les nombreuses monographies régionales, inspirées par la méthodologie des precurseurs tels de Martonne (1902). C'est pourquoi notre intêrét converge plutôt vers l'analyse des tendances séculaires du peuplement carpatique, souvent dans un contexte plus large, national, vue sa position géographique centrale et son rôle important dans la construction territoriale roumaine. Ces tendances sont analysées en utilisant quelques éléments susceptibles à exprimer les disparités, les discontinuités, les clivages et les oppositions liées au diverses formes d'utilisation des ressources dont l'exploitation est souvent ancienne.

L'hypothèse principale porte sur l'existence d'une forte particularité des trois tronçons carpathiques roumains (oriental, méridional et occidental), exprimant une correspondance avec leur potentiel naturel et avec l'accessibilité aux éléménts de la modernité (infrastructure de communication, industrialisation, urbanisation etc.). L'hypothèse sécondaire concerne le rôle contradictoire des formes modernes d'exploitation des ressources, surtout pendant la période totalitaire, avec des excés dont les éffets sont encore très sensibles. C'est au long de ces fils directeurs qu'on veut surprendre l'existence des tendances de dépeuplement, donc d'une certaine vulnérabilité locale ou régionale, dans une chaîne montagneuse encore assez densement peuplée et ayant un parcours assez particulier en se rapportant à d'autres exemples européens.

2. MATERIEL ET METHODE

La constitution des bases de données nécessaires a été le résultat d'une longue activité de collecte, à partir des sources extrêmement diverses, vue l'appartenance d'une grande partie du territoire concerné à l'Empire Austro–Hongrois, avant 1918.

La base de données essentielle porte sur l'évolution numérique de la population depuis 1850, reconstituée au niveau du dernier échelon de la division administrative contemporaine, les villages et les villes (2 914 unités statistiques). Le moment de début a été choisi en conformité avec l'historiographie

roumaine qui considère le milieu du XIX[e] siècle une rupture conduisant à la modernisation sociale et économique. Ceci concerne aussi des transformations dans la dynamique et dans la distribution de la population, l'étalement de la série chronologique au long de quelques 150 ans permettant à notre avis de surprendre d'une manière plus correcte les tendances de longue durée. La qualité des sources utilisées pour cette reconstitution est partiellement discutable. Les enregistrements effectuées au XIX[e] siècle sont souvent fragmentées, présentant des lacunes qu'on peut pourtant surmonter par extrapolation des informations concernant des unités administratives de rang supérieur (communal ou régional). On a ainsi utilisé deux catégories de sources:

– omogénes et continues, issues des récensements roumains effectués depuis 1930 et des bases de données territoriales de l'Institut National de Statistique;

– hétérogènes et incohérentes du point de vue chronologique, pour les sources antèrieures au 1918. Statistiquement nous avons opéré une organisation en six séries chronologiques (1850, 1860, 1880, 1890, 1900, 1910), l'inégalité des intervalles correspondant au degré de fiabilité des informations. Les décalages chronologiques entre les enregistrements du Vieux Royaume et ceux de l'Empire Austro – Hongrois ont été suffisament reduites pour permettre l'homogénéisation des données. La plupart de ces sources sont de type récensement, depuis 1860 pour le Vieux Royaume et depuis 1850 pour les provinces sous juridiction autrichienne. Cette base de données, a servi pour l'agrégation à plusieurs échelles d'analyse: les trois tronçons carpatiques, catégories d'altitude, milieu de résidence, position géographique et accéssibilité, etc. En synthèse, le tableau suivant précise les sources utilisées pour chacune des sériés chronologiques:

Tableau 1

Les sources utilisées pour la constitution de la base principale de données

Série chronologique	Vieux Royaume	Empire Austro–Hongrois (Hongrie en 1941)
1850	Giurescu, C.C., 1957, *Principatele Române la începutul secolului al XIX-lea*, Ed.Ştiinţifică, Bucureşti. (données sur les ménages).	Varga, E.A., *Erdély etnikai és felekeweti statistikája. Népszámlálási adatok 1850–1992 között*, Teleki Lászlo Alapitvány, Budapest, 1998. Worobkiewicz, E., 1893, *Die geographische Statistischen Verhältnisse der Bukowina*, Lemberg. Werenka, D., 1895, *Topographie der Bukowina*, Cernăuţi. Torouţiu, I.E., 1916, *Poporaţia şi clasele sociale din Bucovina*, Bucureşti. Grigorovitza, E., 1908, *Le dictionnaire géographique de la Bucovine*, Socec, Bucarest
1860	***1862, *Din lucrările statistice ale Moldovei. Recensământul din 1859–1860*, vol. I–II, Iaşi (donées numériques). Filipescu-Dubău, G., 1864, *Charta Principatelor Unite ale României cu circumvecinele ţări*, Bucureşti (données sur les ménages)	
1880	Lahovary, Al.G., Brătianu, I.C., Tocilescu G., 1898–1902, *Marele Dicţionar Geografic al României*, vol. I–V, Bucureşti. (donées numériques à partir d'estimations officielles)	
1890		
1900	Colescu, L., *Rezultatele recensământului general al populaţiei din 1899*, ICS, Bucureşti.	
1910	***„1914–1915, *Dicţionarul statistic al României întocmit e baza rezultatelor recensământului din 19.12.1912*, vol. I–II, ICS, Bucureşti.	
1930	***1941, *Recensământul general al populaţiei din 29.12.1930*, vol II., ICS, Bucureşti.	
1941	***1944, *Recensământul general al populaţiei din 06.04.1941*, ICS, Bucureşti.	Varga, E.A., *Erdély etnikai és felekeweti statistikája. Népszámlálási adatok 1850–1992 között*, Teleki Lászlo Alapitvány, Budapest, 1998.
1948	Golopenţia, A., 1948, *Populaţia R.P.Române la 25 ianuarie 1948*, ICS, Bucureşti.	
1956	***1959–1960, *Recensământul populaţiei din 21.02.1956*, DCS, Bucureşti.	
1966	***1969, *Recensământul populaţiei şi locuinţelor din 15.03.1966*, vol. I–IV, DCS, Bucureşti.	
1977	***1980–1981, *Recensământul populaţiei şi locuinţelor din 05.01.1977*, vol. I–IV, DCS, Bucureşti.	
1992	***1994, *Recensământul populaţiei şi locuinţelor din 07.01.1992*, vol. I–III, CNS, Bucureşti.	
2002	****Recensământul populaţiei şi locuinţelor din 18.03.2002*, Base de données *Tempo-Online*, INS, Bucureşti. (www.insse.ro, consulté en janvier–avril 2014)	
2011	****Recensământul populaţiei şi locuinţelor din 20.10.2011*, Base de données *Tempo-Online*, INS, Bucureşti. (www.insse.ro, consulté en janvier–avril 2014)	

La base de donnée résulté comporte quinze séries chronologiques séparées par des intervalles inégaux et concerne la population stable, sauf pour les enregistrements du XIX^{e} siècle dont la méthodologie d'enregistrement présentait des lacunes.

A côté de cette base de données principales, on avait constitué d'autres bases auxiliaires, concernant les informations suivantes:

– la superficie, exprimée en km^2, nécessaire pour le calcul de la densité de la population. Nous avons retenu les dernières informations fournies par l'Institut National de Statistique (base de données Tempo-Online, consulté en janvier-avril 2014), la reconstitution fidèle des superficies communales pour chaque série chronologique étant presque impossible;

– la structure par âges au dernier recensement, afin d'illustrer le processus de vieillissement, en utilisant le poids de la population âgée de 60 ans et plus en 2011;

– la structure de la population active par secteurs d'activité en 2002, selon le dernier récensement disponible en ce sens-là, nécessaire notamment pour mettre en évidence le degré de ruralité. Nous avons retenu pour l'analyse le poids de chaque secteur;

– la migration temporaire de longue durée, telle qu'elle a été enregistrée par le dernier recensement (2011), utilisée en connexion avec les données antérieures. La population concernée a été rapportée à la population totale enregistrée.

La méthodologie de travail met au centre une démarche synthétique, illustrée par la typologie d'évolution numérique de la population, exprimée par le rythme annuel de croissance, calculé pour chaque intervalle chronologique, selon la formule suivante:

$R_{ac} = \frac{[(P_1 - P_0)/T]}{P_m} * 100$, où P_1 est la population à la fin de l'intervalle, P_0 est la population au début de l'intervalle, T représente la longueur de l'intervalle et P_m est la moyenne de P_1 et de P_0. Pour réaliser la typologie nous avons opté pour la méthode de la classification hiérarchique ascendante, en utilisant le logiciel Statlab. Ce type de classification présente l'avantage de reduire l'enchaînement des classes et, par le biais du calcul de la variance, d'assurer une meilleure homogénéité autour des tendances spécifiques.

Pour illustrer et argumenter les tendances observées, nous avons utilisé aussi la démarche analytique, portant sur les indices et les indicateurs auxiliaires. Une première analyse concerne l'installation du déclin démographique, en utilisant la population maximale atteinte, en excluant la série correspondant à 1948, profondément affectée par la deuxième guerre mondiale. Ensuite, nous avons analysé la densité de la population, dont l'évolution est étroitement liée aux processus d'expansion/contraction du système de peuplement. Les analyses visant la structure et la mobilité de la population complètent la démarche.

Dans le but d'approfondir la signification des tendances exprimées par la typologie de l'évolution numérique de la population, une démarche comparative a été considérée utile. Les critères retenus ont été le milieu de résidence, l'altitude, l'accéssibilité et la position géographique. Ce volet d'analyse concerne aussi une contextualisation au niveau national, afin de mieux comprendre les rapports entre les grandes zones de relief, surtout si l'on pensait à leur distribution parfaite (les montagnes, les aires collinaires et les plaines occupant chacune un tiers du territoire national). Les disparités et les discontinuités observées sont ainsi explicitées d'une manière plus précise. Le tableau méthodologique est complété par quelques études de cas, illustrant le rôle des activités minières, de la touristification ou de la métropolisation dans la dynamique du système de peuplement de la région étudiée.

Loin d'avoir intégré toutes les variables explicatives nécessaires à créer un tableau complet de l'évolution du système de peuplement des Carpates Roumaines pendant ces 150 ans, on peut les

compenser avec des références bibliographiques, en particulier en ce qui concerne l'aménagement du territoire, l'utilisation des terrains et les particularités géomorphologiques.

3. RÉSULTATS ET DISCUSSIONS

Le traitement statistique des informations collectées et l'analyse descriptive des résultats démontrent l'existence d'une évolution différentiée du peuplement de la région carpatique: plus ancienne et plus intense dans les massifs plus bas, riches en minéraux (la plupart des Carpates Occidentaux); plus tardive et diffuse dans la haute montagne (Carpates Méridionaux ou Alpes de Transylvanie) et dans les massifs jadis fortement boisés (les Carpates Orientales). En dehors de cette observation synthétique se manifestent des nombreuses particularités locales, perceptibles soit dans la typologie de l'évolution numérique soit dans l'analyse des indicateurs auxiliaires. Ceci impose des commentaires en deux volet distincts, l'un notant d'abord les particularités et le second fournissant des explications.

3.1. La typologie de l'évolution numérique de la population dans les Carpates Roumaines

La présentation des observations issues de la typologie effectué selon la méthodologie exposée n'est pas possible sans rediger un auxiliaire cartographique. La création d'un fond cartographique s'est ainsi imposé, à partir des cartes topographiques militaires à l'échelle de 1: 100 000, publiées en 1996. La carte résulté a été utilisée pour l'illustration graphique de toutes les analyses effectuées. Le résultat de la classification hièrarchique ascendante et l'analyse de la variance inter et intra-classes, démontrent une évolution très différenciée, explicable aussi par le nombre d'unités statistiques (les 2 914 villes et villages, selon la division administrative actuelle) que par le forte particularisme local, expression d'un contexte économique, social et culturel originel. C'est pourquoi nous avons retenu pour l'analyse 12 types distincts, nombre situé au limité supérieure de la pertinence. Ceux-ci se regroupent en 6 catégories selon les tendances générales, responsable pour leur différentiation étant le niveau du rythme annuel de croissance, à côté de la précocité du déclin démographique (Fig. 1, Tableau 2). L'illustration graphique de la classification typologique est accompagnée par un tableau synthètique présentant le profil d'évolution de chaque type et, pour des raisons comparatives, le profil moyen et selon le milieu actuel de résidence.

Le premier group est formé par les types 1 et 2, localisés surtout dans les Carpates Occidentales, avec une fréquence plus grande dans leur partie centrale, anciennement mise en valeur pour ses ressources minières (Monts Metaliferi, Monts Poiana Ruscăi). L'évolution spécifique est caractérisée par deux périodes distinctes: jusqu'au 1941, marquée par une croissance modérée, avec des valeurs descendantes; après 1941, marquée par un déclin continu, accentué, effet aussi d'une surreprésentation de la population masculine (Boțan, 2010, p. 321). Le type 1 se distingue par la précocite du déclin, entammé dejà entre 1910–1930, amélioré par une faible croissance entre 1930–1941 et continué ensuite avec un niveau très bas, ménant à la dépopulation de certains villages (16 villages à côté de 109 qui avaient moins de 10 habitans en 2011). La taille de ces villages pouvait être considérée moyenne au début de la période analysée (238 pour le type 1, respectivement 273 habitants pour le type 2), mais de nos jours elle est très réduite (31, respectivement 75 habitans). Le taille maximale a été atteinte vers 1912, respectivement vers 1941, dépassant à peine 300 habitants. Illustratif pour ceux types sont les exemples de Roșia Montană et de Tarnița (Fig. 2).

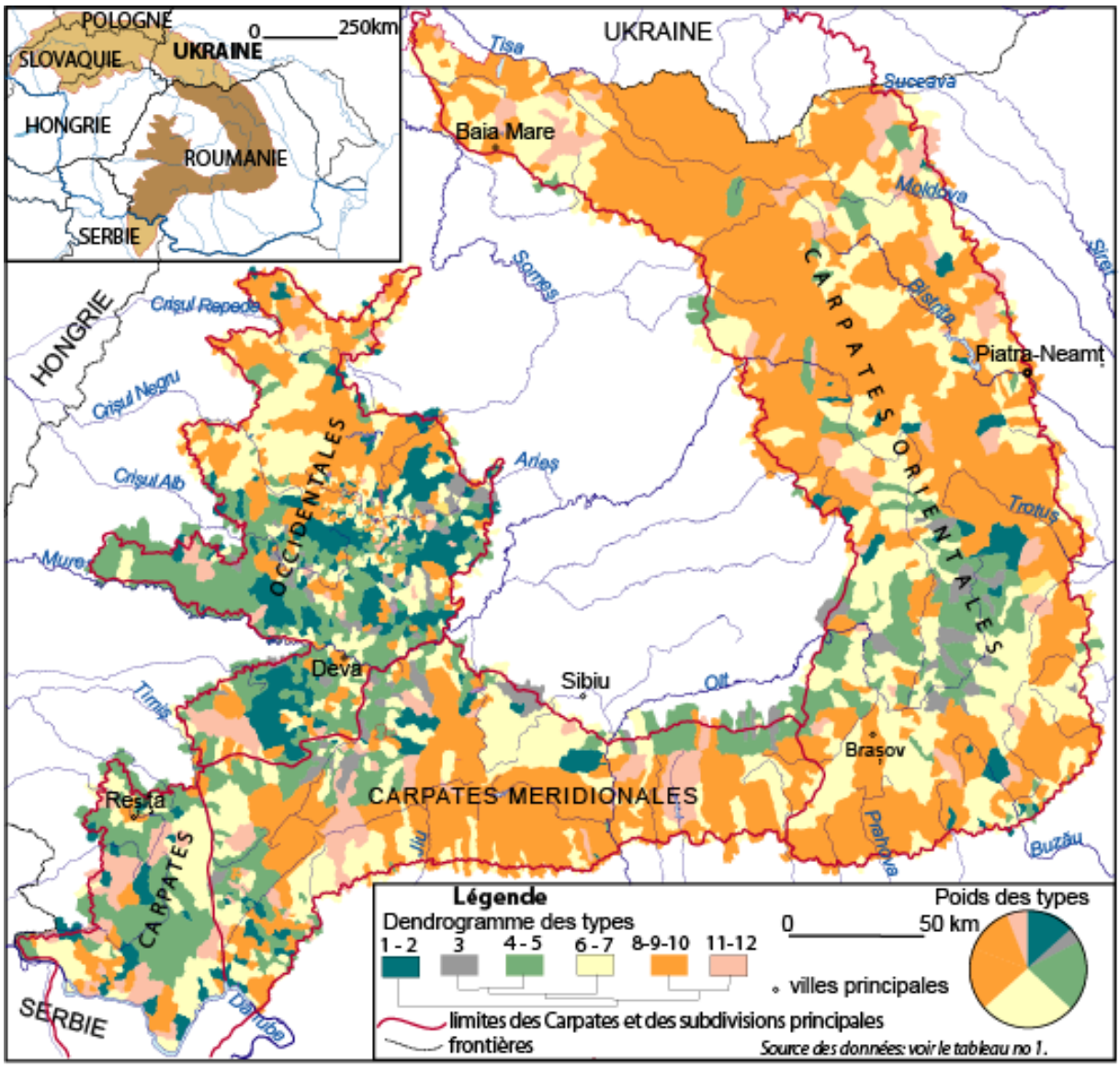


Fig. 1 – La typologie de l'évolution numérique de la population (1850–2011). En médaillon, la position des Carpates Roumaines dans l'ensemble de la chaîne carpatique.

Tableau 2

Le profil des types, selon le rythme annuel de croissance, exprimé en % (1850–2011)

Type / Période	1850–1860	1860–1880	1880–1890	1890–1900	1900–1910	1910–1930	1930–1941	1941–1948	1948–1956	1956–1966	1966–1977	1977–1992	1992–2002	2002–2011
1	0,78	0,82	0,96	0,73	0,33	–0,28	0,14	–0,83	–1,00	–1,40	–4,30	–4,37	–7,06	–4,21
2	0,87	0,91	0,76	0,76	0,60	0,02	0,55	–0,61	–0,32	–0,99	–2,08	–3,14	–3,36	–3,85
3	–0,49	–0,30	–0,05	0,08	0,22	–0,40	0,16	–0,87	–0,54	–0,47	–1,09	–1,54	–0,90	–1,14
4	0,59	0,65	0,64	0,56	0,12	–0,53	–0,16	–0,73	–0,68	–0,88	–1,12	–1,78	–1,13	–1,46
5	0,25	0,30	0,32	0,44	0,15	–0,17	0,20	–0,70	0,38	–0,01	–0,21	–0,81	0,10	–0,15
6	0,74	0,81	0,74	0,84	0,94	0,24	0,75	–0,35	0,31	0,07	–0,47	–1,03	–0,92	–1,17
7	0,50	0,46	0,42	0,64	0,70	0,19	0,78	–0,27	1,53	1,34	0,80	–0,11	–0,18	–0,55

Tableau 2 (continuer)

8	1,58	1,81	1,78	2,45	0,95	1,02	1,48	0,46	1,87	1,55	0,20	–0,35	–0,16	–0,68
9	1,13	1,17	1,27	1,48	1,63	0,52	1,64	–0,09	4,09	2,84	2,57	0,97	–1,20	–1,90
10	2,06	1,98	1,62	3,10	0,95	0,66	1,51	0,18	0,75	–0,52	–1,89	–2,42	–1,88	–2,24
11	1,29	1,39	1,58	1,62	0,18	–0,68	–1,08	–2,46	1,49	1,23	–0,46	–0,74	–1,28	–1,65
12	1,38	1,56	1,58	1,42	1,09	0,42	0,94	–0,32	1,15	0,36	–1,93	–3,53	0,75	–0,25
Total	0,60	0,78	0,78	0,97	0,86	0,21	0,76	–0,59	1,77	1,23	1,09	0,46	–0,83	–1,02
Urbain	0,82	1,10	1,00	1,53	1,41	0,63	1,51	–0,68	4,42	2,87	2,91	1,58	–1,11	–1,26
Rural	0,55	0,71	0,73	0,83	0,71	0,09	0,52	–0,57	0,72	0,38	–0,19	–0,65	–0,52	–0,76

Source des données: voir Tableau 1.

A ce group s'intègrent aussi certains villages développés autour des colonies d'exploitation forestière, dans les hautes vallées, surtout dans les Carpates Orientales, souvent très instables, avec une population à prédominance masculine et qui n'ont pas été révitalisés par le régime communiste.

Le deuxième group concerne seulement le type 3, peu fréquent mais dont la localisation est assez cohérente du point de vue géographique: les pentes septentrionales de Carpates Méridionales (Mărginimea Sibiului, Pays de l'Olt) et dans le bassin supérieur de l'Olt, des villages de peuplement saxon et sicule (dép. de Braşov et Covasna surtout). Il s'agit de villages qu'on pouvait considéré de grosse taille au début de la période analysée (766 habitants en moyenne) et qui ont connu une décroissance plutôt lente mais continue, sauf les intervalles 1890–1910 et 1930–1941 marqués par la stagnation (Fig. 2). Cette décroissance arrivait à reduire constamment la taille moyenne, jusqu'à 343 habitants en 2011 (Fig. 3). Si le premier exemple concerne surtout des villages caractérisés par la prédominance des activités pastorales (dont la transumance était la régle et conduisait souvent au déplacements définitif en dehors de l'aire montagneuse), dans le deuxième cas il faut prendre en compté la précocité de la transition démographique et de l'émigration qui caracterisait les communautés allemandes de Transylvanie (Crăciun, p. 28, in Bolovan et all., 2005).

Pourtant, la relative lenteur du déclin au long des dérnières décennies assure encore des chances à resister, leur évolution étant une forme de résilience face à l'urbanisation accentué caractérisant l'aire métropolitaine de Sibiu et de Braşov, deux villes d'importance régionale. Dans ce type s'intégrent aussi certains localités minières intercalés entre les types 1 et 2, ayant mieux résisté pendant les dérnières décennies, souvent par une diversification des activités.

Le troisième group, concerne les types 4 et 5, le premier étant plus représentatif. Leur évolution présente trois phases distinctes: croissance lente avant 1910, évolution hésitante entre 1910–1956 et déclin, après 1956. La divergence entre ces deux types apparaît dans la troisième phase, quand la type 4 connaît un déclin continu, accentué vers la fin de la période totalitaire et le type 5 manifeste une faible reprise de la croissance après 1992, voir stagnation depuis 2002. Leur position géographique est aussi divergente: le premier caractérise les sud–ouest des Carpates Occidentales (Monts du Banat, Massif de Zarand) et le deuxième présente une autocorrélatio spatiale avec le type 3, auquel il ressemble aussi par la peuplement majoritairement saxon et sicule, au moins au début de la période. Il y aussi une différence de taille entre les deux types, le premier caractérisant plutôt des villages moyennes et le deuxième des gros villages. Le déclin plus accentué dans la dernière phase avait réduit considérablement la taille dans le cas du type 4 (dont le maximum atteint arrivait à 715 habitants en 1912, effectif moyen ramené à seulement 299 habitans en 2011).

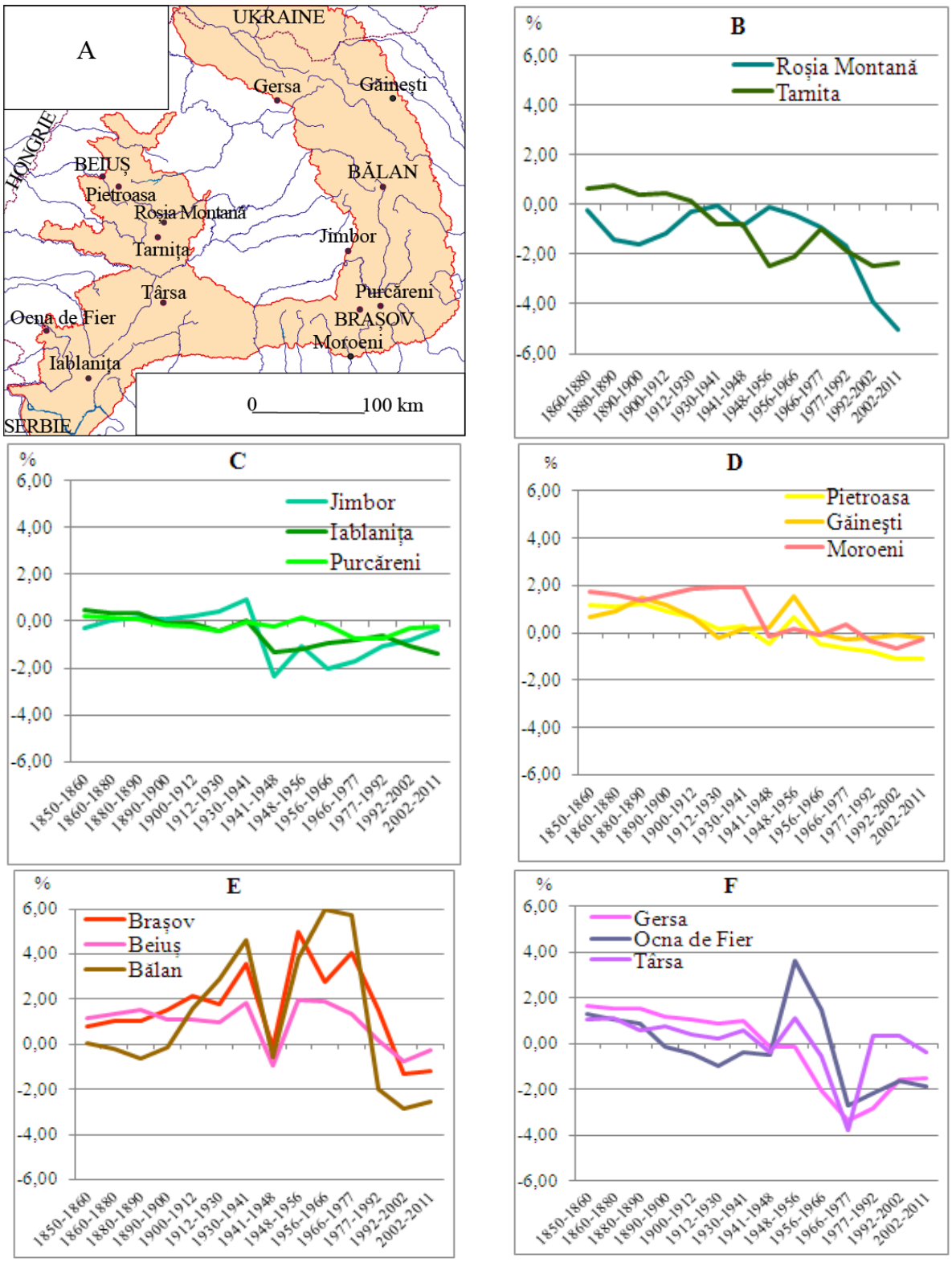


Fig. 2 – La dynamique du rythme annuel de croissance. Quelques exemples caractéristiques: localisation (A); types 1, 2 (B), types 3, 4 et 5 (C); types 6, 7, 8 (D), type 9 (E); types 10, 11 et 12 (F).

On peut ainsi prendre en compte l'accélération du déclin et la manifestation de tendances de dépeuplement, favorisées souvent par l'isolement, aussi des vallées secondaires que des dépressions refoulées, telle est le cas de la Dépression d'Almăj, au sud du Banat (Ianăș, p. 378, 2011). Il s'agit de régions profondement rurales, entrées précocement dans la transition démographique (depuis la fin de XIX^{e} selon certains études). Au contraire, le type 5 avait réussi préserver sa taille (822 habitants aussi au début qu'à la fin de la période étudiée, le maximum atteint étant assez proche, avec deux pics, 975 habitants en 1912 et 970 en 1941). Cette relative stabilité est en relation avec la proximité des villes et un meilleur accés aux infrastructures moderne. On peut ainsi conclure que la divergence entre ces deux types s'est produite après 1956 dans le contexte de l'inégal accés à la modernité (Fig. 2).

Le quatriéme group comprend les types 6 et 7, bien représentées, rassemblant ¼ du nombre total d'unités statistiques. Leur distribution spatiale est plus disperse, dans les aires dépressionaires, dans les vallées principales, au contact des régions collinaires environnantes, sans être absentes dans les hautes vallées. Le type 6 est plus fréquent dans les Carpates Occidentales et le type 7 dans les Carpates Orientales et Méridionales. Ils apparaîssent presque toujours associés vue leur profil à peu prés identique avant 1941: croissance relativement constante, modérée, très proche de la moyenne carpatique. Après la deuxième guerre mondiale il se produit la divergence, le type 6 entrant très tôt en déclin, devenu certain après 1966, au contraire du type 7 qui avait mieux résisté, le vrai déclin arrivant pendant les deux dernières décennies (Fig. 2). Ce qui sépare aussi le type 7 c'est la forte croissance des années 1948–1977, qu'on peut expliquer par l'importance de l'économie forestière dans les chaînes orientale et méridionale et par la révitalisation de l'économie pastorale dans le un contexte particulier qui préservait les structures traditionnelles de la propriété. C'est ce qui avaient souligné Oancea et Szwizewski (dans le vollume collectif, Géographie de la Roumanie, 1987, p. 37) ou Blanc (1973, p. 22). Au contraire, dans les vallées et les dépressions des Carpates Occidentales, dont l'altitude est généralement plus modeste, la coopérativisation de l'agriculture pendant l'époque totalitaire avait beaucoup plus avancé dans la montagne, en poussant la main d'œuvre vers les villes et vers les exploitations minières (Popa, 1999, p. 152). On peut parler d'une divergence due à deux modèles différentes de développement local: le premier, caractéristique pour le type 6, basé sur l'industrialisation et l'urbanisation, le second, caractéristique pour le type 7, base sur une économie plus complexe, combinant l'exploitation du bois, et parfois des minerais, avec une agriculture dont l'élévage favorisé par la productivité supérieure des pâturages était un secteur très rentable (et l'est encore de nos jours). C'est une situation décrite à plusieurs reprises dans l'ouvrage collectif déjà mentionné, Géographie de la Roumanie (Barbu et Iosep, p. 92, Poghirc, p. 144, vol. III, 1987). Un autre explication renvoi aussi à la précocité de la transition démographique sur les versants orientés vers le bassin pannonien des Carpates Occidentales (vallées des Criș, couloir de Timiș–Cerna etc.), où le type 6 est prédominant. Les deux types sont assez différentes aussi en ce que concerne la taille moyenne, plus petite pour le type 6 (535 habitants en 2011, avec un maximum en 1966 de 761 habitants), et plus grande dans le cas du type 7, même au début de la période analysée (703 habitants en 1850 et 1 369 en 2011, avec un maximum de 1 449 en 1977). La préservation d'une certaine vitalité démographique, notamment dans la partie nord des Carpates Orientales, doit être aussi prise en compte (cas des dépressions de Maramureș et d'Oaș, où se combine avec la tradition de la migration saisonniére à grande distance pour l'exploitation du bois, voir Velcea, 1964, p. 80).

Le cinquième group rassemble les types 8, 9 et 10, d'ampleur inégale, le premier étant beaucoup plus fréquent. On peut les qualifier comme les plus dynamiques en se rapportant à toute la période étudiée. Le premier domine les hautes vallées des Carpates Orientales aussi que la frange extérieure de la partie centrale des Carpates Méridionale, ailleurs étant plus rare. Regroupant presque un cinquième des unités statistiques analysés, le type 8 comporte quatre phases distinctes: avant 1900 on remarque

un croissance rapide, ascendante, effet engendré aussi par l'extension du système de peuplement dans les vallées sécondaires, sous l'éffet de l'exploitation des ressources forestières, touristiques et minières, voire par le développement des voies de communication transcarpatiques (le cas notamment de la vallée de Prahova, phénomène signalé par Vâlsan, 1971, p. 557); entre 1900–1948, suit une période de croissance plus modérée; entre 1948–1992 se manifeste une nouvelle phase de croissance, très forte au début, suivie après 1992 par une évolution hésitante, autour d'un déclin encore incertain. Les explications de cette évolution particulière après 1948, en grande ligne ressemblant au type 7 du group antérieur, supporte les mêmes explications, avec une importance plus forte de la vitalité démographique, au moins dans les Carpates Orientales et de l'attraction exerçée par l'exploitation des ressources mentionnées. C'est dans ce contexte que s'est produit un changement radical du point de vue de la taille des localités concernés: plutôt réduite en 1850 (268 habitants en moyenne), mais suffisament grande en 2011 (1 059 habitants, face au maximum de 1 090 habitants enregistré en 1977).

Le type 9 est le type urbain par excellence, tout en regroupant certains villages qui ont connu une évolution semblable, en deux phases distinctes: une avant 1941, marquée par une croissance très forte, avec deux pics vers 1900 et vers 1941; l'autre après l'intermezzo tragique de la période 1941–1948, caractérise par une croissance explosive, avec des valeurs descendantes vers 1992, les deux dérnières décennies offrant une image de quasi-dépopulation urbaine, explicable dans le contexte de la transition. Les exemples présentés expriment les deux catégories urbains les plus typiques: les villes anciennes, qui avaient connu des rythms plus lents (le cas de Beiuș); les villes nouvelles, développées souvent à partir de villages, de type mono-industriel, ayant connu une croissance spéctaculaire pendant la période totalitare, surtout entre 1966 et 1992, suivie d'une chute aussi fulminante (le cas de la ville minière de Bălan). Les villages concernés par ce type ont suivi une croissance rapide de leur dimension.

En ce que concerne la troisième composante de ce group, elle n'est qu'une variante de ces deux antérieures, s'agissant surtout de nouveaux villages apparus entre 1850–1941, la plupart en tant que colonies d'exploitation forestière, très dinamiques avant 1900, avec une reprise évidente entre 1948–1956 (période d'une exploitation sauvage par les sociétés mixtes soviéto-roumaines, tel le célébre Sovromlemn, analysé parmi d'autres par Turnock en 1974). Il s'ensuivit un déclin rapide, effet de la disparition de ces sociétés. Dispersés un peu partout et situés le plus souvent au fond des vallées jadis sauvages, ces villages ont toujours été de petite taille (141 habitants en 1850 et 145 en 2011, avec un maximum de 371 habitants atteint en 1956. Certains, de taille plus grande, connaissent une révigoration par le biais de l'insertion des nouvelles forme de tourisme montagnard, mais l'isolement réduit souvent ces chances (Fig. 2). Finalement, la divergence entre les types 8 et 10 est l'effet de l'accessibilité à l'infrastructure moderne.

Le dernier group concerne deux types, 11 et 12, qu'on peut caractériser par l'évolution contrastante: des périodes de croissance très rapide étant suivies par des épisodes de déclin, souvent accentué. Le type 11, malgré sa dispersion, présente une certaine concentration aux montagnes de Banat, de Bucovine et de Maramureș, dont l'évolution commence avec un phase très dynamique (1850–1912) suivie par un déclin accentué entre 1912 et 1948, période juxtaposée aux deux guerres mondiales. Après 1948, une nouvelle période de croissance, assez forte, permet de récupérer les pertes jusqu'à 1966 et ensuite, le déclin est repris, avec des tendances recentes d'accentuation. Les villages concernés sont le plus souvent de taille moyenne, en 1850 avaient 528 habitants et en 2011 encore plus, 707 habitants, après avoir atteint deux pics, 1 014 habitants en 1912 et 898 en 1966. Le plus souvent il s'agit de deux catégories assez semblables: colonies de peuplement allemand récent, en Bucovine surtout; villages à exploitation minières ayant connus un afflux important de population, souvent étrangère, pendant la deuxième partie du XIX^{e} siècle, au Banat surtout. Le départ de ces

minorités, après 1918 et surtout après 1941, aussi que le déclin partiel des activités minières dans certain cas, sont responsables de cette évolution contrastante. La tradition de la mobilité se manifeste après la chute du régime totalitaire par une forte propension vers l'émigration, temporaire ou définitive qui explique la dernière phase de déclin.

Le type 12 manifeste des contrastes semblables mais la longuer des phases est différente: une longue période de croissance assez soutenue (1850–1966), interrompue pendant la deuxième guerre mondiale est suivie par une courte phase de déclin rapide (1966–1992), récupéré partiellement entre 1992–2002, ensuite connaissant une nouvelle phase de déclin, à un niveau très faible, suggérant une hésitation des tendances. Le plus souvent il s'agit de petites villages (126 habitants en 1850 et 231 en 2011, avec un maximum de 369 en 1966), souvent situés dans la proximité des villes. Le rebond récent peut s'explique dans certains cas par le développement de l'agrotourisme (Fig. 2).

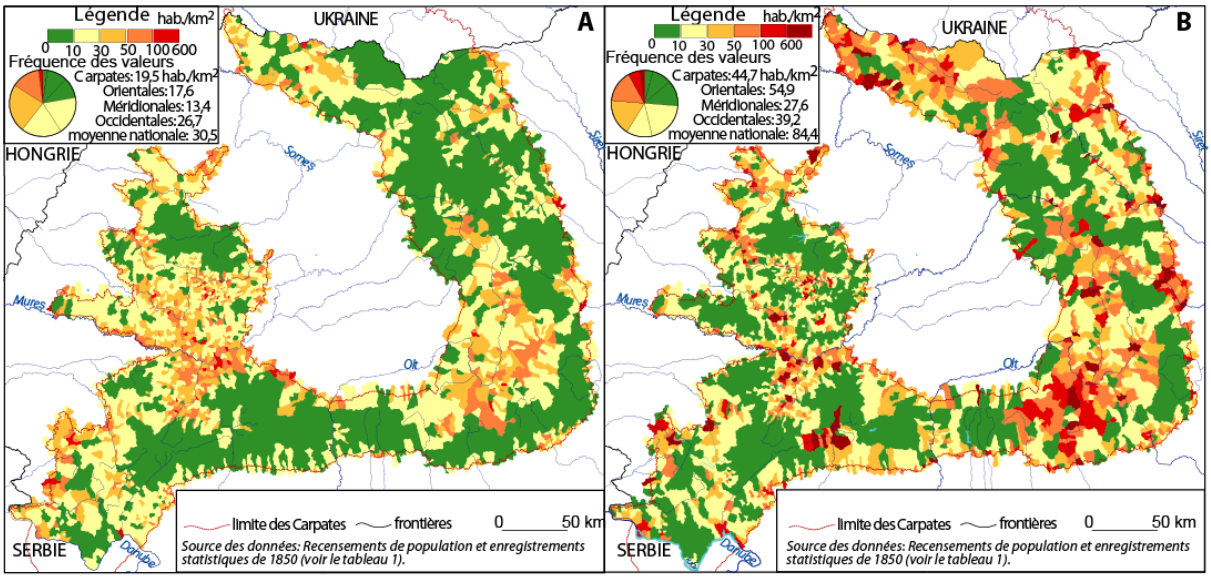
3.2. L'analyse des indicateurs auxiliaires

a) L'évolution de la densité de la population

La distribution spatiale de la population est, généralement, une fonction de la favorabilité naturelle et de l'éfficacité des aménagements territoriaux. Les Carpates Roumaines, par leur altitude, plutôt moyenne, la diversité du support géologique et la position géographique, assure des prémices favorables au peuplement dont l'ancienneté de la présence humaine en est la preuve. L'intensité du peuplement peut être étudiée par l'analyse de plusieurs paramètres, correspondant soit à la morphologie de l'habitat soit à la densité de la population. Ce dernière, malgré ses inexactités, reste très utile, surtout si l'espace étudié est assez homogène. Les cartogrammes dréssés sur la distribution des valeurs en 1850 et en 2010, rélévent des transformations majeures dont la plus importante est la tendance de concentration de la population, effet attendu de la modernisation des structures sociales et économiques.

Au début de la période étudiée, la distribution des valeurs respectait la favorabilité des aires dépressionaires et des larges couloirs, assez densement peuplés, par rapport à la haute montagne et aux vallées secondaires dont le système de peuplement était dans une phase embrionnaire. La basse montagne était aussi densement peuplé, notamment en liaison avec l'expploitation minière (le cas de certains massifs de la chaîne carpatique occidentale). Les zones effectivement vides, situés en dehors de tout système de peuplement étaient pourtant réduites, le matériel cartographique ne tennant pas compte de l'habitat saisonnier, notamment dans les Carpates Méridionaux, où la transhumance était à l'horigine des forte densités au contact des dépressions subcarpatiques (Tufescu, 1982, p. 36). Au contraire de l'image fournie par certaines sources, qui représentaient une grande partie des Carpates comme un vide humain (Turnock, 1958, p. 36), ou considéraient qu'au moins la haute montagne carpatique était parmi les plus faiblement peuplés régions de ce type en Europe (de Martonne, 1985, p. 58), tout en acceptant leur particularité d'avoir une intense utilisation pastorale, les Carpates Roumaines étaient aussi peuplés que d'autres chaînes comparables de l'Europe (la densité de la population dans les Balkans peut être estimée à 43 hab./km^2, en Alpes Dinariques à 41 hab. /km^2, selon les derniers recensements bulgare et serbe et croate). C'est tout aussi vrai que les Alpes, avec leur forte valorisation touristique sont plus peuplés, malgré l'altitude supérieure (70 hab./km^2) mais d'autres chaînes en sont beaucoup plus faiblement peuplés, notamment en Europe Méridionale (Pyrénnées avec seulement 18 hab./km^2, le Pinde avec 26 hab./km^{2,} etc.)[1].

[1] Tous ces éstimations ont utilisé les informations sur la distribution de la population issues des derniers récensements de population effectués dans les pays européens.



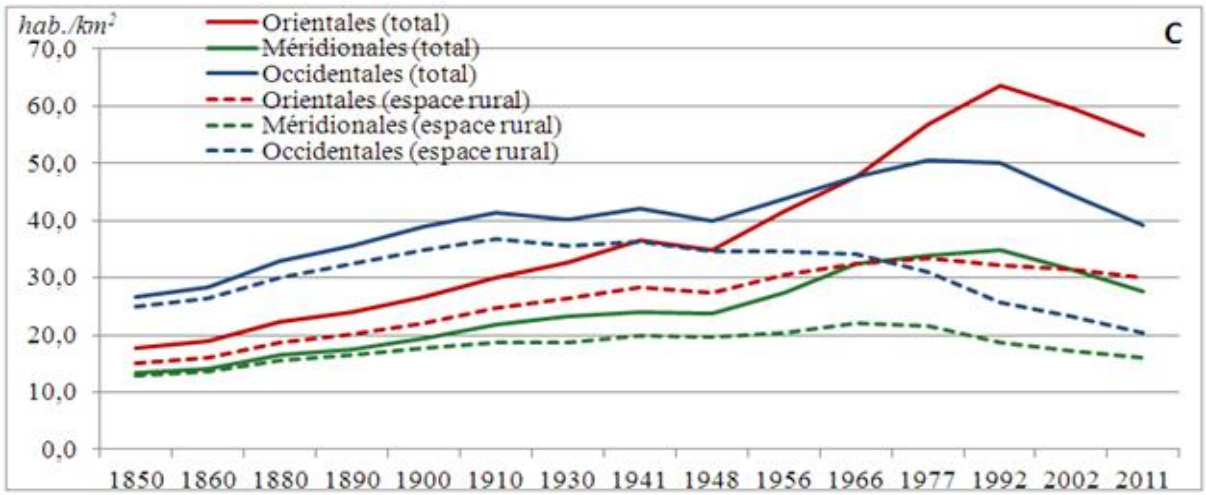


Fig. 3 – L'évolution de la densité générale de la population dans les Carpates Roumaines: en 1850 (A), en 2011 (B), par régions et milieux de résidence (C, 1850–2011). Source des données: voir Tableau 1.

Il faut préciser que dans la tradition géographique roumaine, les Subcarpates, avec leurs nombreuses dépressions densement peuplées sont considérés comme une région à part entière, de sorte que son association avec la chaîne carpatique assurerait à l'ensemble résulté une densité beaucoup plus élevée. La fin de la période étudiée présente un tableau plus complexe, avec des fortes densités dans les aires très urbanisés (dépression de Braşov, Vallée supérieure de Jiu, avec son bassin houiller, région de Baia Mare avec ses exploitations minières, haute vallée touristifiée de Prahova, vallée moyenne de Moldova, etc.). Cette urbanisation alerte, manifestée surtout pendant la période communiste, à un niveau supérieur à la moyenne nationale, était aussi le résultat d'une politique volontariste du régime totalitaire dont le syntagme „socialisme multilatéralement développé" supposait une utilisation complète des ressources minières et énergétiques, y compris en situation de faible efficacité économique. Ceci explique l'apparition des villes et des colonies minières y compris dans les hautes vallées, au

milieu de la montagne (le cas de Bălan dans les Carpates Orientales étant le plus illustratif), voire la réouverture de certains mines abandonnées depuis longtemps (le cas de Rodna, dans la même région, cité par Iacob, 1987 p. 68). Les tendances visibiles de dépeuplement se manifestent dans les Carpates Occidentales, la basse montagne connaîssant une contraction du système de peuplement au long des principales vallées. Les Orientales avaient, au contraire, connu une forte augmentation des valeurs, la vaste aire faiblement peuplée séparant la Moldavie et la Transylvanie étant réduite à quelques poches isolées.

La principale modification dans la distribution de la population dans les Carpates Roumaines réside dans le changement de l'hiérarchie entre les trois grandes régions montagneuses, les Carpates Orientales arrivant en première position, avec un maximum de la densité dépassant largement 60 hab./km^2. Cet avance s'est produit dans le contexte d'une croissance très rapide de la densité de cette région carpatique entre 1948 et 1992. Ce n'est pas seulement le résultat de la croissance urbaine mais aussi d'un dynamisme de certains aires rurales, manifesté par une relative stabilité depuis 1977 (Fig. 3). Les Carpates Méridionales restent les moins péuplés, vue leur massivité, mais la différence par rapport à la chaîne occidentale s'est beaucoup diminuéé, au moins dans les espaces ruraux. Une discussion à part mérité le niveau maximum atteint, arrivé à la fin de la période totalitaire, conformément au modèle national sauf dans les Carpates Occidentales où ce niveau était déjà atteint en 1977, confirmant leur fragilité. Si l'on prendrait en compte seulement les espaces ruraux, le clivage qui sépare cette région est encore plus fort, ce niveau étant atteint déjà en 1941. On peut ainsi parler d'un gradient orienté généralement depuis l'ouest vers l'est de la chaîne carpatique, en ce qui concerne la résistance aux tendances de dépeuplement. La situation des Carpates Orientales ressemble ainsi plutôt à celle des Carpates de l'Ukraine et de la Slovaquie, tandis'que les Carpates Occidentales ont plus de reseemblances avec les Balkans, les Méridionales étant dans une situation intermédiaire. Une analyse à une échelle locale met en évidence une situation encore plus complexe, certains massifs montagneux (Monts de Banat, Zarand, Metaliferi) et dépressions des Carpates Occidentales (Haţeg, Almăj) enregistrant ce niveau maximum vers 1900–1910. Entre la partie sud–ouest et celle située au nord–ouest de cette région se manifeste une différence importante, les massifs oriéntés vers le Plateau de la Transylvanie (donc vers l'intérieur de l'arche carpatique), connaîssant une évolution plus proche de celle spécifique aux Carpates Orientales. La dimension moyenne des points habités est aussi importante, les Carpates Occidentales connaîssant une fréquence supérieure de l'habitat dispersé, souvent dans la haute montagne, phénomène étudie par Butură (1978, p. 62), qui postulait l'importance de la faiblesse qualitative du sol des Monts Apuseni dans la dispersion de l'habitat).

b) Le rôle de la position géographique et de l'accéssibilité dans la rédistribution de la population

A côté de la densité, dans l'étude de la distribution de la population très importante restent les disparités altitudinales et la position géographique. Cette analyse, synthétisée dans le Tableau 3 et dans la figure 10, avait comporté la création d'une base de données dérivée, avec l'altitude moyenne de chaque localité, calculée à partir des cartes topographiques et la position géographique dominante selon l'appartenance à 4 catégories distincts, ayant un rôle essentiel dans la manifestation de l'accéssibilité: les dépressions et les larges couloirs, les vallées principales, les vallées sécondaires, les hauteurs et les interfluves. L'intérêt de cette analyse est de voir si, généralement, dans les Carpates se manifestaient des clivages en fonction de la localisation. Cette investigation empirique, loin d'être parfaite n'est qu'une démarche exploratoire, une analyse compléte de l'accesibilité et de la position présupposant la création d'une base de données plus complexe, presque impossible à dresser à cette échelle d'étude.

Tableau 3

L'évolution du peuplement dans les Carpates Roumaines selon la position géographique de l'habitat (1850–2011)

Paramètres		Dépressions et couloirs		Vallées principales		Vallées secondaires		Hauteurs et interfluves	
		Urbain	Rural	Urbain	Rural	Urbain	Rural	Urbain	Rural
Nombre de localités		58	661	25	261	28	1184	4	703
Croissance (1850=100)	1900	169	131	188	159	164	148	155	137
	1941	279	152	290	207	196	168	177	225
	1992	866	147	1017	251	651	156	126	134
	2011	687	137	786	225	524	134	92	84
Niveau maximum atteint en:	année	1992	1977	1992	1977	1992	1966	1966	1941
	par rapport à 2011	1,26	1,14	1,29	1,15	1,24	1,34	1,53	2,07
Densité de la population (hab./km^2)	1850	40,3	30,1	42,9	14,3	29,4	14,1	26,7	12,8
	2011	277,1	41,2	337,3	32,2	154,3	19,1	63,4	10,8
	Maximum atteint	348,8	47,5	436,3	36,9	191,7	25,4	96,9	22,5

Source des données primaires: voir le tableau 1.
Note: Le milieu de résidence et le nombre de localités est celui de 2011.

Les résultats obtenus ont confirme l'hypothèse formulée *a priori*, postulant l'importance de la position géographique en tant que directeur de la dynamique du système de peuplement. Les plus favorisés pendant la période étudiée semblent avoir été les vallées principales, vecteurs essentiels d'insertion des réseaux modernes de communication. En deuxième rang apparaîssent les dépression et les couloirs mais il faut en tenir compte du fait qu'elles étaient déjà eaucoup plus peuplées au début, la densité de la population rurale étant double par rapport à la catégorie antérieure. Le poind de départ des vallées principales n'était pas différent de celui spécifique aux vallées secondaires, voire des hauteurs, consolidant ainsi l'image de l'existence des vastes zones à peine peuplées dans le passé. On peut ainsi affirmer que le principal clivage, au long de cette période s'est manifesté entre ces trois catégories. L'analyse du niveau maximum atteint confirme la fragilité des systèmes de peuplement localisés sur les vallées secondaires et surtout dans la haute montagne où ceci a été enregistré en 1941. La modernisation des structures sociales et économique de l'époque communiste, notamment en matiére d'extension des réseaux de desserte avait évité ces aires isolées, même de nos jours il y a des hameaux sans réseau electrique et chemins modernisés. Ce qu'il faut remarquer c'est la résistance de la population dans ces conditions, malgré l'ancienneté du déclin, la diminution de la population ne peut pas être considérée très forte. C'est vrai qu'ils existent aussi des cas de dépopulation complète mais ceux-ci sont plutôt des exceptions. Une illustration encore plus touchante peut être tirée du tableau suivant, présentant la situation de la commune de Bistra, situé dans la moyenne vallée de Arieș, tributaire de Mureș, au nord–est des Carpates Occidentales (Tableau 4).

Tableau 4

L'évolution de la population dans la commune de Bistra (département d'Alba), selon la position géographique

Position géographique	*1850*	*1900*	*1941*	*1956*	*1966*	*1977*	*1992*	*2002*	*2011*
Vallée d'Arieș	1042	1125	1444	1478	1744	2112	2533	2845	2786
Vallées secondaires	895	1090	1486	1524	1752	1705	1443	1295	1101
Hauteurs et interfluves	1203	1540	2114	2210	2080	1851	1385	926	653

Source des données: voire Tableau 1.

Cet exemple confirme la tendance de concentration de la population au long des vallées principales, voire dans les dépressions. Cette commune est formée de 35 villages, dont 21 sont situés sur les hauteurs et les interfluves et seulement 4 au long de la vallée principale. Le phénomène de

concentration débute après 1956 dans le contexte où les plans d'extension des réseaux de desserte éléctrique ont été stoppés pour les villages considérés par le régime totalitaire „sans perspectives". A côté de la précarité des réseaux de communication est l'explication la plus à l'aise de cette modification brutale de tendance. C'est ainsi que les 4 villages situés dans la vallée principale ont passé d'un poids de 33% en 1850 à 28% en 1956 et à 61% en 2011. On peut aussi parler de la manifestation de deux phases distinctes: la première, de dissémination du système de peuplement vers la haute montagne, avec une phase imposé par l'exploitation des forêts autour de 1900; la deuxième, d'aller retour, vers la basse vallée, généralement anciennement peuplée, en étroite liaison avec la modernisation. Ce modèle est souvent invoqué dans diverses sources ayant analyse l'évolution du système de peuplement dans certaines régions carpatiques (Apolzan, 1987, p. 246).

L'exemple de la commune de Bistra peut être considéré comme une introduction dans l'analyse de l'évolution de la distribution de la population selon l'altitude (Fig. 4). Les zones d'altitudes correspondent aux particularités Carpates Roumaines. Les différences entre les trois régions sont très visibles et s'expliquent par l'évolution divergente des systèmes de peuplement qui est en étroite liaison avec leurs particularités morphologiques: les Carpates Orientales, avec leurs vastes espaces dépressionaires internes situés à moyenne altitude (600–800 m) s'opposent aux Carpates Méridionales, dont les vallées profondes sont en contrast avec la haute montagne (plus de 2 000 m) et surtout aux Carpates Occidentales, très fragmentés, avec des larges couloirs et dominées par des massifs de basse altitude (fréquemment moins de 1 000 m). L'illustration graphique de la distribution de la population selon l'altidue est soumise ainsi à ces particularités.

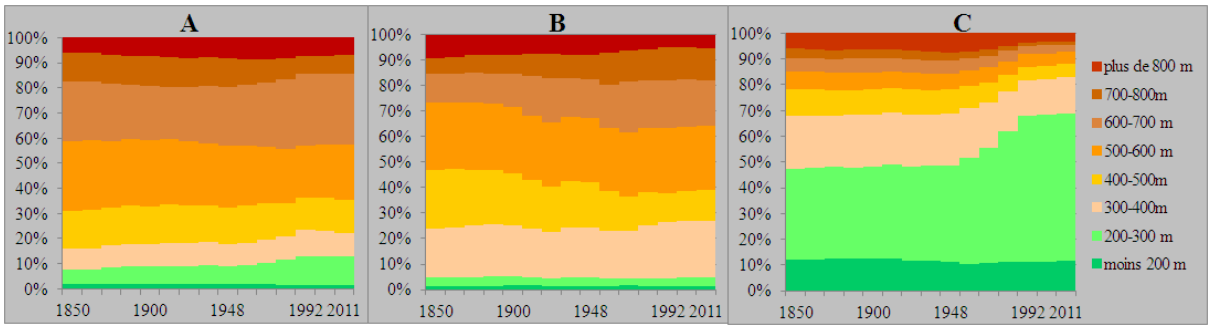


Fig. 4 – L'évolution de la distribution de la population selon l'altitude – Carpates Orientales (A); Carpates Méridionales (B); Carpates Occidentales (C).

Les Carpates Orientales ont connu un évidente tendence de concentration dans les dépressions internes (surtout dans l'intervalle 600–700 m), où est cantonnée la principale agglomération humaine des Carpates Roumaines, la ville de Braşov, et dans les vallées principales disposant de térasses bien développés, permettant le développement d'un réseau d'habitat dissocié, avec des villages allongés disposant d'une dispersion secondaire dans le voisinage (Barbu, 1978, p. 62). La même tendance s'est manifestée aussi aux basses altitudes, surtout après 1966, effet de la concentration industrial-urbaine de l'époque communiste. Ce qui surprend est la résistence des aires situés au-delà de 800 m altitude, au contraire de ce qui s'est passé dans les autres régions. Les systèmes agraires orientés vers une zootechnie plus complexe, utilisant à grande échelle les prés de fauche, à côte de l'exploitation du bois et du traditionnalisme de certaines communautés à habitat dispersé sur les pentes douces de certains massifs (les hutsuls de Obcine, en Bucovine par ex.) ou concentrés dans les hautes vallées supérieures de certains rivières (Trotuş par ex.), expliquent cette particularité. Une cas particulier est celui de la vallée moyenne de Bistriţa Moldave, où les aménagements hydroénergétiques ont imposé le déplacement d'une partie de la population sur les versants, situation rencontrée aussi dans d'autres

régions. Généralement, les Carpates Orientales ont connu plutôt une relative stabilité de la distribution en altitude (Tableau 5).

Dans les Carpates Méridionales il y a des ressemblances avec la région antérieure, la concentration dans les régions dépressionaires situés aux altitudes de 600 à 800 m étant aussi visible, un apport important étant celui de la conurbation minière de la vallée supérieure de Jiu. La tendance visible de diminution du poids, dans l'intervalle 400–500 m surtout, s'explique par la concentration préférentielle de la population dans les dépressions subcarpatiques voisines, notamment sur le versant méridional, phénomène cité depuis longtemps (Vâlsan, 1971, p. 546). Au déla de 800 m est ressentie une diminution continue, malgré l'effort mené pendant la période communiste de stimuler le peuplement de certaines petites villages situés à côté des grands complexes hydroénergétique (sur les rivières Lotru, Râu Mare, Sebeş, par ex.). La modification de la distribution a été, en grandes lignes plus profonde que dans les Carpates Orientales.

Tableau 5

L'utilisation des terrains dans les Carpates Roumaines

Région	Terres arables	Pâturages	Prése de fauche	Vignes et vergers	Fôrets
Carpates Orientales	8,8	14,9	13,2	0,5	55,9
Carpates Méridionales	5,4	16,5	8,2	1	61,3
Carpates Occidentales	10,2	20	10,8	0,5	52,3
CARPATES ROUMAINES	**8,7**	**16,8**	**11,7**	**0,6**	**55,5**

Source: Base de données Tempo Online, INS, Bucarest, consulté en janvier 2014 (www.insse.ro).

Dans les Carpates Occidentales on observe, après une longue période de stabilité, une rapide tendance de concentration aux basses altitudes, accelérée après 1956 et stabilisée depuis 1992. L'abandon de la haute montagne est aussi très visible, tel qu'il a été déjà illustré par l'exemple de la commune de Bistra. La pauvreté du sol et le déclin des activités minières dans certains massifs sont souvent cités comme explications pour cette tendance de dépeuplement des hauteurs et des vallées secondaires mais un rôle important peut être attribué aussi à l'urbanisation très forte des couloirs et des vallées principales (surtout le Couloir de Mureș), impliquant une attraction très forte de la main d'œuvre rurale, longtemps habitués avec les activités nonagricoles. A côte d'une évolution démographique marqué par la précocité de la transition démographique, fortement influencé par la présence des communautés allemandes et hongroises dans les villes et d'un degré d'instruction supérieur à la moyenne nationale dans le passé, ces facteurs expliquent la propension précoce vers la migration des populations de ces massifs montagneux, y compris dans le siage de la migration internationale.

c) Le profile économique et l' émigration – vecteurs de la dynamique récente de la population dans les Carpates Roumaines

Les disparités observées dans l'analyse de l'évolution numérique de la population et de la distribution spatiale sont en étroite corrélation avec le profile économique des communautés carpatiques. Les particularités spécifiques aux trois grandes régions s'expliquent aussi par le degré de ruralité, dont la structure de la population active par secteurs d'activité peut servir d'indicateur. C'est ce qui est présenté dans la Fig. 5, à coté de l'incidence de l'émigration temporaire de longue durée (plus d'une année, selon la méthodologie utilisée par le récensement). L'indicateur présente la situation enregistrée au recensement effectué en 2002, le dernier n'ayant pas encore publié les informations nécessaires. Vue la rigidité de cet indicateur à moyen terme il est assez illustratif pour mettre en évidence des corrélations avec d'autres paramètres géo-démographiques. L'incidence de l'émigration temporaire à long terme, selon le dernier récensement de 2011, peut approfondir ces corrélations. Il faut noter que le récensement antérieur, effectué en 2002 avait enregistré une

distribution très semblable du phénomène, de sorte qu'on peut mettre facilement en corrélation les deux cartogrammes.

La typologie de la structure de la population active par secteurs d'activité met en évidence la présence de 4 situations distinctes: a) une première catégorie, concernant plus d'un quart des localités est marqué par un fort degré de ruralité, avec une dependance extrême par rapport au secteur primaire; b) la deuxième, ayant le même poids, est aussi profondément rural mais avec une importance sensible des secteurs secondaire et tertiaire; c) le troisième concerne presque 2/5 des localités et est caractérise par un certain équilibre entre les trois secteurs; 4) le dernier concerne les villes, certains espaces périurbains et les localités à forte spécialisation secondaire, voire tertiaire (centre miniers, stations touristiques etc.). On peut ainsi affirmer que les Carpates Roumaines restent encore un espace à dominance rurale, à l'image du pays entier, avec des fortes disparités entre les espaces profondèment ruraux, cantonés le plus souvent dans les vallées isolées de la haute montagne et les espaces, plus réduits, marqués par une modernisation visibile des structures économiques et sociales. Il y a donc une coïncidence entre les régions caractérisées par une certaine stabilité démographique et les regions avancées du point de vue de la structure économique de la population. Pourtant dans les Carpates Orientales, des vastes espaces profondèment ruraux connaissent aussi la stabilité démographique dans un contexte déjà expliqué et sous l'incidence très forte de l'émigration temporaire de longue durée.

La situation des Carpates Orientales est assez diffèrente de celle des autres régions, moins afféctées par l'émigration, malgré un profile socio-économique assez proche. C'est leur densité supérieure qui peut expliquer la propension vers l'émigration mais aussi leur structure par âges plus favorable, exprimant une réelle pression sur le marché local d'emploi et sur les ressources (notamment le bois dont on accuse souvent la surexploitation). La faible incidence de l'émigration dans la partie centre-occidentale des Carpates Orientales est étroitement liée à la présence de la minorité hongroise (Pays des Szecklers), fortement orientée vers les migrations de courte durée vers la Hongrie surtout mais aussi envers le tourisme et la petite industrie, vu leur esprit d'entreprise. L'émigration parraît ainsi liée tantôt aux structures économiques avancées, plus sensibles aux crises du marché d'émploi au long de la transition, tantôt aux régions isolées, profondèment rurales et avec excédent de main d'œuvre. La frange externe des Carpates Orientales est marquée par la superposition des deux situations, dans le contexte d'une pression démographique supérieure et d'un voisinage dont l'état économique est encore plus fragile. De ce point de vue, cette région peut connaître à moyen terme des tendances de dépeuplement, l'émigration définitive étant de plus en plus fréquente. Dans les Carpates Méridionales, la disposition marginale du réseau de peuplement, facilité l'influence urbaine et assure, le plus souvent, une diversification des activités, à côté de la persistance des communautés ancrés dans une économie pastorale bien adaptée au contexte géographique local, voire au marché des produits traditionnels (fromage, textiles). Par exemple, des communautés comme celles de Jina ou Poiana Sibiului, avec un pourcentage très fort de la population occupée dans le secteur primaire, offrent, au contraire, une image favorable du point de vue édilitaire, la modernisation de l'infrastructure étant avancée, presque urbanisée, grâce aux atouts touristiques induits par la préservation des structures économiques et sociales traditionnelles.

Le rôle des villes carpatiques dans ce contexte reste contradictoire. Leur difficultés économiques accumulées au long d'une transition longue et controversée les rendent très fragiles, notamment en situation de spécialisation avancée dans le secteur secondaire. Les plus affectées sont les villes minières, mais cette fragilité avait atteint même les villes adaptés à l'économie agro-forestière locale. Malgré tout, les plus importantes ont commencé exerçer une influence visible dans l'aire voisine qui s'est adapté rapidement aux exigences de la société postindustrielle. L'exemple présenté dans le tableau suivant, surprend la tendance timide de la périurbanisation, en contrepartie d'une véritable dépopulation des villes:

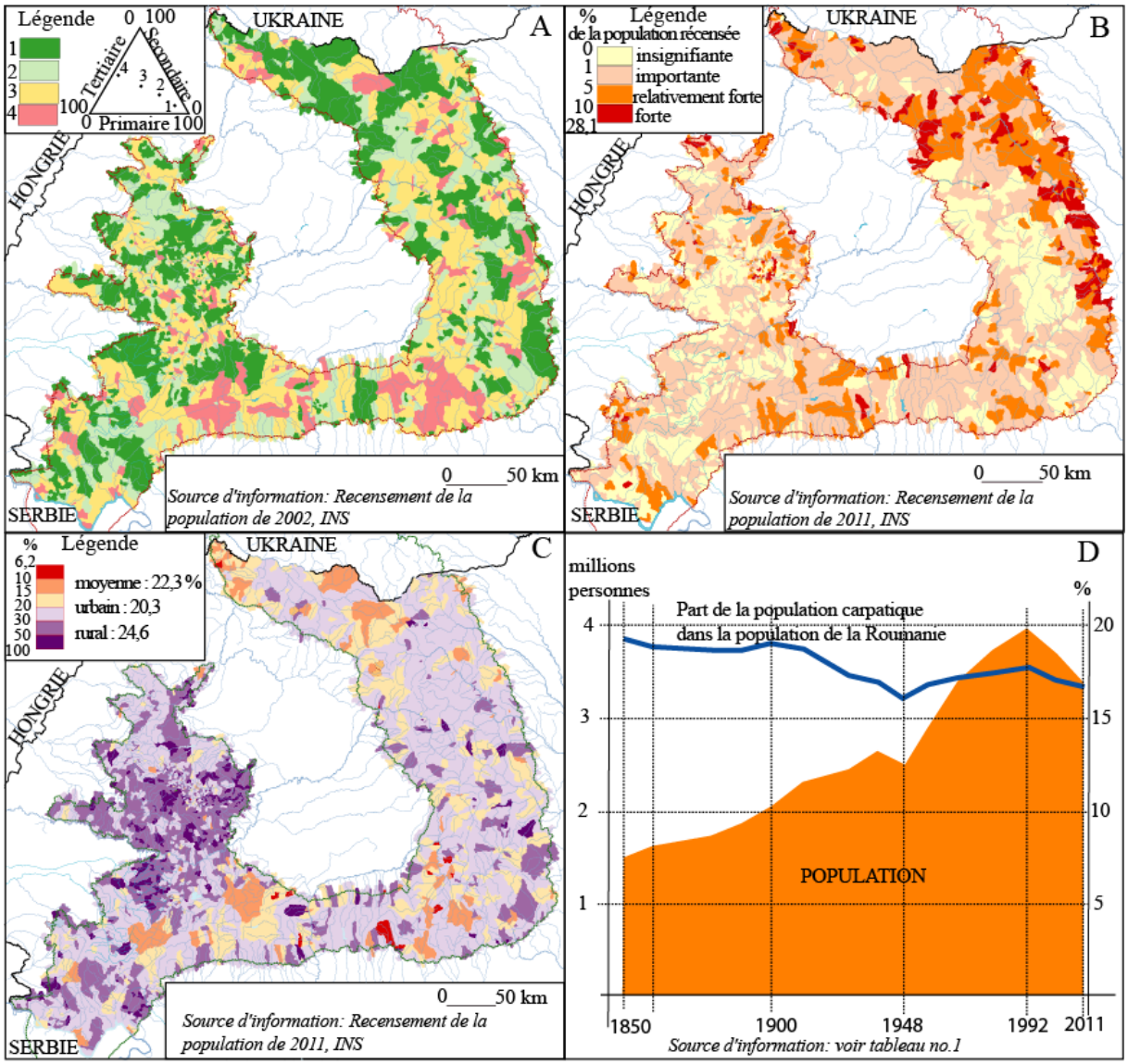


Fig. 5 – La typologie de la structure de la population par secteurs d'activité (A); L'émigration temporaire de longue durée (B); Le poids de la population âgée (plus de 60 ans, C); L'évolution numérique de la population dans les Carpates Roumaines et l'évolution de leur poids dans la population totale de Roumanie (D).

Tableau 6

L'évolution de la population dans l'aire métropolitaine de Brașov (1948–2011)

	Population stable							Rapport 2011/1992
	1948	1956	1966	1977	1992	2002	2011	
Zone métropolitaine	**182977**	**244480**	**305276**	**435353**	**500654**	**460107**	**430329**	**0,860**
Ville de Brașov	82637	123734	163195	256295	323536	284246	252814	0,781
Petites et moyennes villes	43265	55874	70891	100250	108258	103315	98710	0,912
Villages situés à 5–15 km	21155	23538	27166	31590	24688	26478	29923	1,212
Villages situés à 15–30 km	35920	41334	44024	47218	44172	46068	48882	1,107

Source des données statistiques: Recensements de population (1948–2011, voire Tableau 1).

d) Le vieillissement démographique-effet ou vecteur des changements démographiques récents

Une dernière analyse corrélative vise la structure de la population par groupes d'âges, selon la situation illustrée par le récensement effectué en 2011. L'indicateur utilisé a été le poids de la population âgée (60 ans et plus), selon les standards roumaines (l'espérance de vie à la naissance n'excéde encore 74 ans).

Le matériel cartographique exposé démontre la présence de fortes disparités, entre la majéure partie des Carpates Occidentaux et le reste de la région étudiée (Fig. 5). Le vieillissement profond et presque généralisé, surtout dans leur partie centrale et explique ainsi la faible incidence de l'émigration temporaire de longue durée et le degré avancé de ruralité dans certains massifs (Zarand, Poiana Ruscăi, Trascău). Le phénomène n'épargne pas les autres régions carpatiques, dominées par des valeurs proche de la moyenne, surtout dans les zones marqués par la forte incidence de l'émigration. Une discussion à part mérite le vieillissement urbain, en accélération rapide due à l'accumulation massive d'une population adulte de 45 à 60 ans, effet de l'urbanization forçée des années 1950–1990. La politique volontariste du régime totalitaire et la transition économique réticente qui s'est ensuivi sera décomptée par une génération peu nombreuse, submérgée par les tâches sociales.

Les Carpates Roumaines sont devenus plus fragiles pendant les dernières décennies par rapport aux aires collinaires et aux plaines, le progrès du vieillissement étant très visible notamment depuis 2022. Les plaines, malgré leur vieillissement précoce induit par la collectivisation forçée du secteur primaire, manifestent un ralentissement, aussi que les régions collinaires. Exemptée par la collectivisation en majéure partie, préservant ses formes traditionnelles d'aménagement rural et bénéficiant d'investissements massives dans l'exploitation des ressources au long de la période totalitaire, la campagne carpatique est devenue fragile du point de vue de sa structure démographique. Cette fragilité affecte aussi les villes qui ont connu la plus forte progréssion depuis 1992 (Tableau 7). Ces changements ont affecté aussi la vitalité démographique pendant cette période, l'évolution du solde naturel moyen enregistrant des tendances régressives, aussi dans le milieu rural que dans les villes. La comparaison entre les trois grandes régions d'altitude de Roumanie, démontre la vulnérabilité supérieure des Carpates: au début de la période analysée, la région avait une situation plutôt satisfaisante mais les tendances régressives avaient conduit les villes carpatiques dans une position défavorable et les espaces ruraux avaient connu une détérioration rapide de cet indicateur. Au contraire, les aires collinaires et surtout les plaines, ont connu des évolutions moins graves. Longtemps privilégiée au niveau national, la montagne carpatique semble avoir perdu ses atouts en faveur des régions plus basses. Un indice illustratif dans ce sens-là peut être le secteur du bâtiment: le poids de la région carpatique dans la construction de nouvelles maisons entre 2007–2012 est de seulement 12,6%, beaucoup moins que le poids dans la population totale, qu dépasse 16,3%.

Tableau 7

L'évolution comparative de l'indice de vieillissement en Roumanie (1930–2011) et du solde naturel (1990–2012)

Année / Période	Vieux(60 ans et plus)/ Jeuns (0–14 ans)					
	Milieu urbain			Milieu rural		
	Carpates	Aires collinaires	Plaines	**Carpates**	Aires collinaires	Plaines
1930	**0,17**	0,17	0,18	**0,18**	0,13	0,12
1966	**0,37**	0,45	0,62	**0,5**	0,42	0,5
1992	**0,41**	0,39	0,58	**0,88**	1,05	1,16
2002	**0,84**	0,79	1,07	**1,13**	1,21	1,36
2011	**1,36**	1,29	1,48	**1,39**	1,37	1,5
	Solde naturel moyen (‰)					
1990–1994	**3,3**	3,9	1,6	**–0,2**	–1,2	–3,1
1995–1999	**0,5**	1,3	–0,7	**–2,1**	–2,9	–5
2000–2004	**–0,2**	0,7	–0,9	**–2,5**	–3,1	–4,6
2005–2009	**0**	1,4	0	**–3,2**	–3,5	–4
2010–2012	**–1,1**	0,4	–1,0	**–3,7**	–4,5	–4,5

Source des données: Récensements roumains de 1930, 1966, 1977, 1992 et 2011.

4. CONCLUSIONS

Les résultats et les discussions présentés confirment en grande partie les hypothèses formulées. Les trois régions carpatiques, personalisées du point de vue géomorphologique et altitudinal, présentent des fortes particularités aussi en ce qui concerne leur évolution géo-démographique, traduites par des modèles dynamiques souvent divergents que par leur état économique actuel. C'est ainsi qu'on peut prévisionner des situations de dépeuplement imminent dans les Carpates Occidentales, plus basses et densement peuplées dans le passé, vue la présence d'un déclin démographique plus que centenaire, avec une érosion massive de la structure par âge, souvent dans des régions très isolées. Par opposition, les Carpates Orientales, avec leurs larges vallées et vastes dépressions internes sont caractérisées d'une manière plus évidente par des tendances de concentration linéaire ou aréolaire de la population, avec des puissantes agglomérations nodales, telle celle caractérisant la Dépression de Braşov, situé au plein centre du pays, carrefour des principales axes nationales de communication. Les Carpates Méridionales, plus hautes et massifs, ont connu une tendance de concentration linéaire au long du contact avec les dépressions subcarpatiques, à côté de quelques agglomérations dans les vallées riches en ressources minières (Vallée de Jiu), devenu très fragiles au long de la transition. L'exploitation des ressources semble avoir imposé aussi des évolutions divergentes, les communautés orientées vers l'exploitation complexe, typiquement montagneuse, agro-pastorale et forestiére manifestant une plus grande stabilité démographique, même en situation d'isolement, tel est le cas de certaines vallées profondes du nord des Carpates Orientales, plus rarement ailleurs. De même, très adaptées semble avoir été aussi les communautés traditionnellement transhumantes des Carpates Méridionales La spécialisation minière, et souvent touristique avait conduit à une fragilisation des structures sociales et économiques au long de la transition, situation typique dans les massifs anciennement peuplés par des communautés minières, surtout dans la partie centrale et méridionale des Carpates Occidentales mais aussi dans la très connue vallée touristique de Prahova.

La tendance d'abandon progressif de la montagne en faveur des dépressions et des vallées principales avait commencé au début du XX^{e} siècle mais elle a été stoppée par la politique volontariste du parti communiste qui s'efforçait de valoriser même des ressources sans valeur économique, déterminant une extension quasi-artificielle du système de peuplement, dont il subsiste encore un grand nombre de chantiers abandonnés colonies d'exploitation. Un rôle important dans l'arrêt du déclin précoce de certaines régions l'a eu aussi la préservation partielle de la propriété paysanne et l'industrialisation, les villages des montagnes ayant ainsi mieux résisté devant l'exode rural inéxorable que ceux des collines et des plaines durant le régime totalitaire. Ceci explique partiellement le maintien du poids des régions carpatiques dans la population totale du pays (autour de 16,1 %, après un maximum de 19,4 % vers 1850, pour une supérficie constituant 30,3% du total national, voire Fig. 5).

On peut y ajouter à ce tableau l'agrarisation de l'occupation de la main d'œuvre rurale, générale dans les campagnes roumaines. Pourtant, la montagne carpatique garde l'avantage d'une meilleure desserte, visible dans le poids supérieur de la population occupée dans les services (34,8% par rapport au 30,2%, valeur moyenne nationale). Celles-ci sont stimulées localement par les nouvelles formes d'utilisation du potentiel naturel, notamment touristique (le cas du couloir Bran-Rucăr dans les Carpates Méridionales ou des Obcine, au nord des Carpates Orientales). Localement aussi on peut constater un ancrage de certaines communautés dans leurs activités traditionnelles liées à l'exploitation du bois, la poterie ou à des diverses systèmes d'élévage. On peut ainsi affirmer que les Carpates Roumaines présentent localement une vitalité laquelle pourrait les soustraire encore aux dangers du dépeuplement. Cette vitalité semble particuliser les Carpates, et est expliqué par la modernisation incomplète des structures économiques et sociales, par opposition aux autres chaînes montagneuses d'Europe (Roman, Vergatti, 2002, p. 36). Dans cette direction un rôle important l'auront les politiques communautaires spécifiques des organismes européens concernés. Généralement, les administrations des communes carpatiques semblent avoir un certain avantage dans l'accés aux fonds européens déstinés au développement rural, héritage d'une vie communautaire moins pérturbé par les régime

communiste, d'où la préservation d'un esprit entrepreneurial plus vif. L'apparence d'un déclin plus fort que dans les plaines ou dans les régions collinaires peut être regardé aussi comme une nécessaire régulation de la pression anthropique vue la densité de la population. L'avenir de la montagne carpatique réside encore dans l'importance accordée aux espaces protégés, leur paysage étant une ressource encore peu utilisée. Malgré l'intensité du peuplement et les excés liés à l'exploitation sauvage des ressources elle garde son rôle identitaire non seulement pour la population locale.

BIBLIOGRAPHIE

Apolzan L. (1987), *Carpații – tezaur de istorie. Perenitatea așezărilor risipite pe înălțimi,* Editura Științifică și Enciclopedică, București.

Barbu N. (1976), *Obcinele Bucovinei*, Editura Științifică și Enciclopedică, București.

Blanc A. (1973), *La Roumanie, le fait national dans une economie socialiste*, Bordas, Paris.

Bolovan S.P., Bolovan I., Pădurean C. (2005), *Transilvania în sec.XIX–XX. Studii de edmografie istorică*, Presa Universitară Clujeană, Cluj-Napoca.

Boțan C.V. (2010), *Țara Moților. Studiu de geografie regională*, Presa Universitară Clujeană, Cluj-Napoca.

Butură V. (1978), *Etnografia poporului român*, Dacia, Cluj-Napoca.

Colescu L. (1941), *Rezultatele recensământului general al populației din 1899*, ICS, București.

Ficheux R. (1996), *Les Monts Apuseni (Bihor). Vallées et applanissements*, Editura Academiei Române, București.

Filipescu-Dubău G. (1864), *Harta Principatelor Unite cu țările vecine*, București.

Giurescu C.C. (1957), *Principatele Unite la începutul secolului al XIX-lea*, Editura Științifică și Enciclopedică, București.

Golopenția A. (1949), *Populația R.P.R. la 25 ianuarie 1948*, ICS, București.

Grigorovitza E. (1908), *Dicționarul geografic al Bucovinei*, Socec, București.

Ianăș Ana-Neli (2011), *Țara Almăjului. Studiu de geografie regională*, Presa Universitară Clujeană, Cluj-Napoca.

Lahovary Al.G., Brătianu I.C., Tocilescu G. (1898–1902), *Marele dicționar geografic al României*, tomes **I–IV**, Socec, București.

de Martonne E. (1902), *La Valachie, essai de monographie géographie*, Armand Colin, Paris.

de Martonne E. (1985), *Lucrări geografice despre România*, Editura Academiei R.S.R., București.

Meteș Ș. (1977), *Emigrări românești din Transilvania în secolele XIII–XX*, Editura Științifică și Enciclopedică, București.

Popa N. (1999), *Țara Hațegului. Potențialul de dezvoltare a sistemului de populare*, Brumar, Timișoara.

Roman L. Vergatti R. Ș. (2002), *Studii de demografie istorică românească*, Editura Enciclopedica, București.

Torouțiu I.E. (1916), *Poporația și clasele sociale în Bucovina*, Socec, București.

Tufescu V. (1982), *Oamenii din Carpați*, Sport-Turism, București.

Turnock D. (1974), *Economic Geography of Romania*, G.Bell&Sons, London.

Vâlsan G. (1971), *Opere complete*, Editura Științifică, București.

Varga E.A. (1998), *Erdély etnikai és felekeweti statistikája. Népszámlálási adatok 1850–1992 között*, Teleki László Alapitvány, Budapest.

Velcea I. (1964), *Țara Oașului*, Editura Academiei R.S.R., București.

Vuia R. (1943), *Aspecte etnografice ale continuității poporului român în Transilvania,* Astra, Sibiu.

Werenka D. (1895), *Topographie der Bukowina*, Cernăuți.

Worobkiewicz E. (1893), *Die geographische Statistischen Verhältnisse der Bukowina*, Lemberg.

*** (1987), *Geografia României*, Editura Academiei R.S.R., București.

*** (1862), *Din lucrările statistice ale Moldovei. Recensământul din 1859–1860*, vol. I–II, Iași.

*** (1913), *Dicționarul statistic al României, realizat pe baza rezultatelor recensământului din 19.12.2012*, vol I–II, ICS, București.

*** (1941), *Recensământul general al populației din 29.12.1930*, vol. II, ICS, București.

*** (1944), *Recensământul general al populației din 06.04.1941*, vol. II, ICS, București.

*** (1960), *Recensământul populației din 21.02.1956*, vol. II, DCS, București.

*** (1969), *Recensământul populației și locuințelor din 15.03.1966*, vol. I–IV, DCS, București.

*** (1980), *Recensământul populației și locuințelor din 05.01.1977*, vol. I–IV, DCS, București.

*** (1994), *Recensământul populației și locuințelor din 07.01.1992*, vol. I–III, DCS, București.

*** (2004), *Recensământul populației și locuințelor din 18.03.2002, Baza de date Tempo-Online*, INS, București (www.insse.ro).

*** (2013), *Recensământul populației și locuințelor din 20.10.2011, Baza de date Tempo-Online*, INS, București (www.insse.ro).

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URBANIZATION TRENDS AND URBAN PLANNING STRATEGIES IN THREE MAJOR MIDDLE EASTERN COUNTRIES: IRAN, EGYPT, AND TURKEY

MARYAMSADAT HOSSEINI[*], AMR AH. GOUDA[**], HOUSHMAND E. MASOUMI[***]

Key-words: urbanization, urban population, urban development strategies, urban policy, urban sprawl, the Middle East.

Abstract. Rapid urbanization has turned into a problematic phenomenon laying negative effects on the Middle Eastern cities and their peripheries. Although fast increase in urban population of the countries of the region has been well-researched, the connections to urban development strategies and patterns are being neglected. This paper examines the time coincidence of some of the dominant planning trends of the past decades that are considered to be associated with the intensive urban population changes. The paper attempts to discuss over the points in which the three countries witnessed significant increase and decrease in fertility rates. For that, the data of the World Bank have been applied. The graphs seen in this paper have been produced by the Google public data from the World Bank website, which provides the possibility of separating urban and rural populations. The descriptive analysis of this study shows that these vigorous changes of population growth rates have been more powerful in Iran and Turkey and steadier in Egypt. Examples of weak planning in the three target countries of this study, Iran, Egypt, and Turkey, such as failure in new city planning in Egypt, extensive sprawl in Turkish cities, rural-urban migration in Iran and Turkey, and the policy of wholesale land selling in Iran depict uncontrolled and vis-à-vis urban planning taking the wrong route. It is concluded that controlling urbanization trends in emerging countries, like the Middle Eastern states, requires a strong and strict urban planning system that avoids trial and error.

1. INTRODUCTION

After the Second World War, high-density urban areas started to expand outward rapidly and concentrated urban areas were transformed to the sprawling metropolitan regions. Now, more than 70 years after the World War II, the cities are still expanding outward in rapid motion, consuming more land and more resources; putting the life of hundreds of species into the danger of extinction, increase the air pollution dramatically and pollute the water and soil with toxic chemicals, which in turn intoxicate the food we are consuming. In the race to conquer more land, we have put the environment at a big risk apart from the economic, social, health and spatial planning concerns, which can bring about tremendous costs.

All the above occurred in parallel with the rapid growth of urban population and urbanization in the Middle East in the second half of the twentieth century. The outcomes of the demographic studies have clearly defined the circumstances of a rapid jump in urban population in the region. Thus, repeating them is of no significance for knowledge production. However, what is still less-studied is the coincidence of the urban planning strategies and policies with the historical, demographic dynamics in the Middle Eastern countries. This would be more meaningful to be scrutinized with strong focus on urban population changes.

[*] PhD student, Global Urban Studies, Rutgers University. NJ, USA. Email: mary.hosseini@rutgers.edu.

[**] PhD student, M.Sc., First affiliation: Center for Technology and Society, Technische Universität Berlin, Germany. Hardenbergstr. 16–18, Berlin 10623, Germany. Second affiliation: Architecture Dept., Faculty of Engineering, Ain Shams University. 1 Sarayat St., Abassia, Cairo, Egypt. Email: gouda@ztg.tu-berlin.de.

[***] Senior researcher, PhD, Center for Technology and Society, Technische Universität Berlin, Germany. Hardenbergstr. 16-18, Berlin 10623, Germany. Email: masoumi@tu-berlin.de.

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It is worth-mentioning that the approach of this paper is not analyzing the causality of urbanization trends, but the association and coincidence of the urban population increase with the urban planning strategies that are described. In other words, fast urbanization can be the result of planning decision, or the other way around. However, this is not the topic of the paper. In the context of the Middle East, the planning systems have tried to control the urbanization trends by nation-wide housing and development plans, for instance, the new city development plans of Iran and Egypt that led to planning tens of new cities, many of which are not only satellite towns, but are stand-alone cities intended to provide employment and leisure amenities for millions of residents. The failure of most of these efforts has been put to discussion in several academic studies. What this paper wants to present is the time-line of urban population changes together with the chronological analysis of urban development phenomena.

Another point is that this analysis cannot be generalized to the rich states of the south of the Persian Gulf that have very high urbanization rates. The problems seen in the metropolitan areas of the larger countries of the region have been presented since the aftermath of the world wars, while the urban challenges of cities like Manama, Doha, Dubai, Abu Dhabi, and the like date back to the fast developments after 1990s. Thus, it is not relevant to generalize the approach of this paper to those areas.

The objective of this paper is to make a connection between population change trends, particularly urbanization on the one hand, and Middle Eastern housing and urban development on the other hand. It is hypothesized that "strong coincidence and correlation exists between the urban population and urbanization rates in the larger countries of the region with urban policies made after 1960, mostly considered as failure. The failure of such planning policies has led to unsustainability of urban life and also had a secondary effect on urban and rural populations".

2. LITERATURE REVIEW

In order to be able to carry out a precise analysis one should first have a clear definition of urban sprawl and a coherent understanding of this complex process. Yet, finding a common definition for this phenomenon is not as easy as it seems to be. In most papers addressing the issue of urban sprawl, lack of standard definition for this phenomenon is striking.

There are various definitions on which the various measurement methods are based. Looking at different papers in this area, despite the considerable literature, it seems that the authors chose, or presented their own version of "urban sprawl" according to their own background and approach and this for sure has affected the definition a great deal. Opinions on sprawl held by researchers, policy-makers and urban planners differ sharply and these differences complicate the process of finding a common definition. This fact was pointed out in many papers. Harvey and Clark (Harvey & Clark, 1965) noted that urban sprawl is often discussed without any associated definition at all. Bhatta *et al.* expressed this complication in finding a common definition in his paper, as well by saying "there is no common definition of urban sprawl and as a concept, it suffers from difficulties in definition." (Bhatta, Saraswati, Bandyopadhyay, 2010) Brueckner mentioned that "urban sprawl means different things to different people" (Brueckner, 2000) and that "many would claim to know it when they see it" (Bhatta, 2010).

With regard to all discussions about the definition of urban sprawl, it is clear that, depending on the different geographical, social and economic circumstances, urban sprawl can have different shapes and thus, different definitions. But, according to what was reviewed for this study, the following definition is suggested. It is the essence of almost all the definitions of urban sprawl.

"Urban Sprawl is a planned or unplanned outward expansion of urban areas that usually creates low-density residential patterns."

Sprawl is one of those multilayered concepts that have been studied over the years, from different perspectives. Surely, huge numbers of papers are dedicated to the factors behind this phenomenon.

Population growth, increase of income and decrease of commuting costs are the main causes of urban sprawl stated in the American literature. Margo (1992) stated in his article that around fifty percent of the suburbanization in the period of 1950–1980 was due to the increase in people's income. In some papers, such as the works of Ewing et al. (Ewing *et al.*, 2002) and Brueckner (2000), the change in the taste of an American, regarding the choice of living and working place, changes in residents' shopping habits, and also government, or state mortgage loans are mentioned.

Increasing rates of population growth and urban population increase have been considered to be among the most influential factors behind urban sprawl in Iran, Egypt and Turley as well. In Iran, this phenomenon has been the result of a high natural population growth rate, specifically in the early years after the 1979 revolution, as well as the increasing rate of rural-to-urban migration (Aliakbari, 2004; UN Habitat, 2008; Movahed, 2004; Shahraki *et al.*, 2012a). In Egypt, population increase, although not steady between 1960 and 2014, contributed to the expansion of cities. Population increase in general can be attributed to the high-fertility rates; albeit their declining trend, yet but they still exceed the substitution rate, the improving health conditions and the decline in infant mortality (Khalifa *et al.*, 2000).

Government policies also play a significant role in shaping this new development pattern. Taxing and zoning policies, subsidization of land and government loans are among the factors that encourage the urban sprawl. Brueckner (2000) emphasizes in several papers that property taxation contributes to urban sprawl a specially "when the substitution between housing and other goods is low" (Brueckner & Kim, 2003). He suggests a land-tax regime to remedy this situation. Ewing stated that "Sprawl is the product of subsidies and other market imperfections." (Ewing, 1997). Moreover, land transfer and spatial planning policies also did encourage the urban sprawl in Iran as well (Kamrava, 2006; Azizi, 2009).

3. METHODOLOGY

Three large countries of the region are taken to show the status of urbanization and urban population. Iran, Egypt, and Turkey have the largest cities and metropolitan areas. The only megacities of the region, Tehran, Cairo, and Istanbul, are located in these countries. The urban population of the three countries has in recent decades steadily increased. The paper attempts to discuss the points in which the three countries witnessed significant increase and decrease in fertility rates. For that, the data of the World Bank have been applied. The graphs seen in this paper have been produced by the Google public data from the World Bank website, which provides the possibility of separating urban and rural populations. This online tool enabled the authors to undertake a descriptive analysis of the effects of social and political events on urban and rural populations. Moreover, the housing and urban policies of the target counties are linked to the demographic trends explored by the above-mentioned data.

4. RESULTS

Iran is the eighteenth largest country in the world, with an area of 1,648,195 sq.km. According to the World Bank Data, the population of Iran has increased from 21.9 million in 1960 to 77.44 million in 2013 as Figure 2 shows. The country is divided five regions with thirty-one provinces (ostān), the provinces are divided into counties (shahrestān), and subdivided into districts (bakhsh) and sub-districts (dehestān). Tehran, the capital of the country, is the most populous city of Iran; Mashhad,

Isfahan, Karaj, Tabriz and Shiraz come after Tehran for being the most populous cities of the country (Fig. 1, table 1).

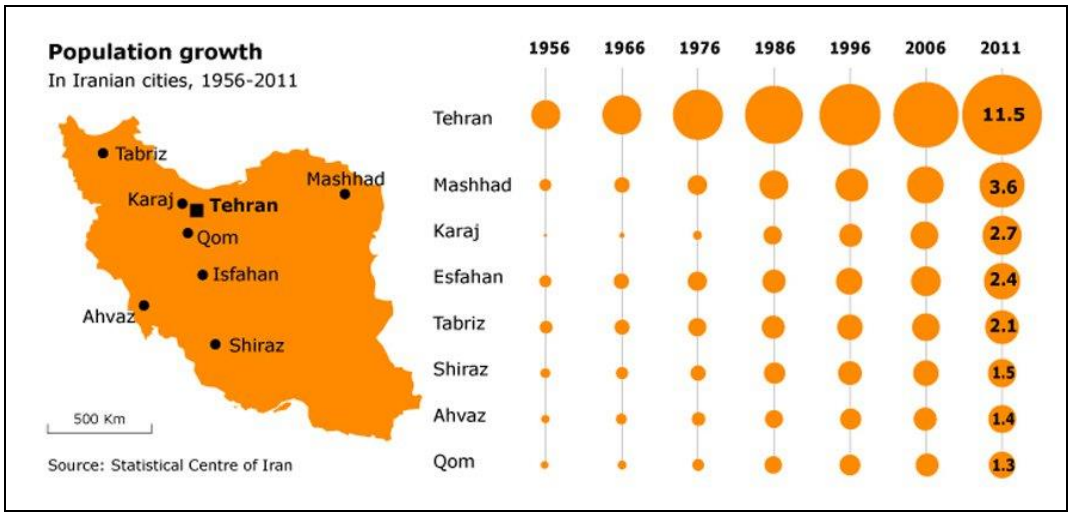

Fig. 1 – The largest cities of Iran and their population between 1956 and 2011. Cited in https://chronicle.fanack.com/iran/population/, originally from Statistical Centre of Iran (2012).

Table 1

The population of the 6 most populous cities of Iran according to the Iran Census 2012.
Source: Statistical Center of Iran (2012).

Rank	Name	Province	Population
1	Tehran	Tehran	8,154,051
2	Mashhad	Khorasan-e Razavi	2,749,374
3	Isfahan	Isfahan	1,756,126
4	Karaj	Alborz	1,614,626
5	Tabriz	East Azarbaijan	1,494,988
6	Shiraz	Fars	1,460,665

According to the World Bank data, in the period of 1960 to 1980, the rural population of Iran was larger than its urban population. In 1960, the urban population was almost half the rural one, but this trend would reverse after 1980. As Figs 2 and 3 show, Iran had 19.32 million urban population in 1980, a number slightly lower than the rural population which was 19.56 million. In 1981, for the first time the urban population exceeded the rural one and reached 20.39 million, which was slightly more compared to the 20.04 million rural populations. The rural population had an increasing rate for ten years (1981-1991) and after that, from 1992, on the rural population shown a decreasing rate and reached 21.2 million in 2014.

The share of urban population has dramatically increased during 1960-2014. Data show that 33.7 percent of the population lived in urban areas in 1960. This number changed to 72.8 percent in 2014; the average slope of the urban population from 1960 to 1981 was 0.6, while this value became 1.1 between 1981 and 2014. Considering the constant increase, it can be deduced that the urban population did increase at a faster pace after 1980. This faster pace can be explained by the pro-nationalist atmosphere after the eight-year war between Iran and Iraq (1980-1988) and also by the influx of refugee immigrants after 1980.

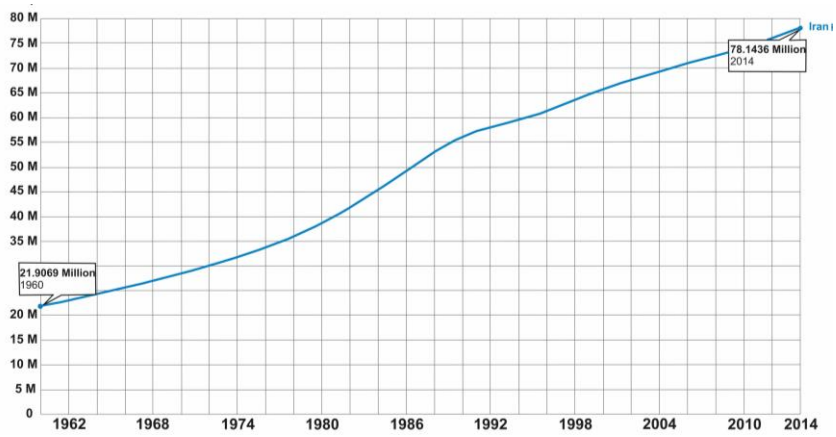

Fig. 2 – The population of Iran: Midyear estimates of the resident population.
Source: World Bank Database.

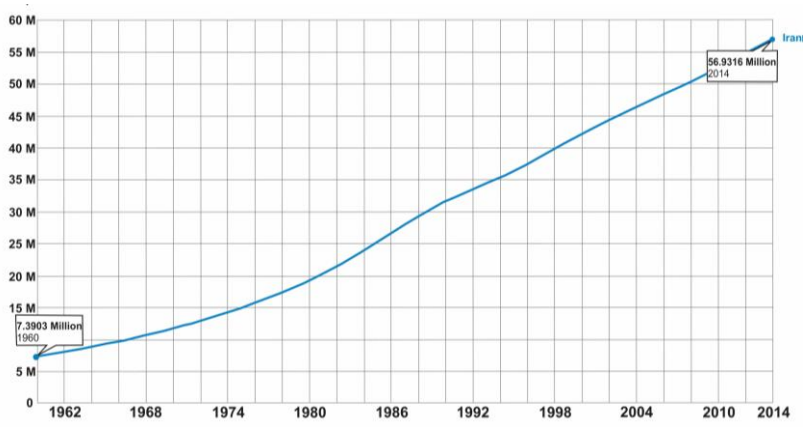

Fig. 3 – The urban population of Iran: Midyear estimates of the resident population.
Source: World Bank Database.

Egypt comprises 27 governorates, with 183 rural districts (Marakiz) and 216 cities (excluding Cairo governorate, which has no affiliations) (IDSC, 2014), most of the cities are capitals of the Marakiz. In the last 5 decades, urban growth and urbanization, spurred mainly by population increase, has been evident in almost all small, medium (moderate) and big sized cities of Egypt (Abu-Lughod, 1965; Robson *et al.*, 2012; Shaalan, 2013). In 2006, 7 cities had more than 500,000 inhabitants (Robson *et al.*, 2012) compared to only two (Cairo & Alexandria) in 1960 (Abu-Lughod, 1965).

As Figs 4 and 5 show, Egypt's population grew from around 28 million in 1960 to around 82 million in 2013 with gross urban population of around 36 million in 2013. However, the data on the share of urban/rural population provides us with another perspective. According to WB data, the share of urban population remained almost steady (around 43%) from1975 to 2014 and this shows that the major part of the population reside in the areas defined as rural parts. Although the share of rural population decreased from 62.1% in 1960 to 56.7% in 1975, no huge changes were observed since then (The World Bank, 2016). Within that protracted urban expansion, informal infringements upon arable lands in the vicinity of the urban agglomerations and formal new desert cities are symptomatic of urban sprawls. Ostensibly, they represent a dichotomy; but the qualities of urban sprawls are

inscribed within their formation dynamics and in their final spatial form, although some of the sprawling attributes can relatively diminish in time.

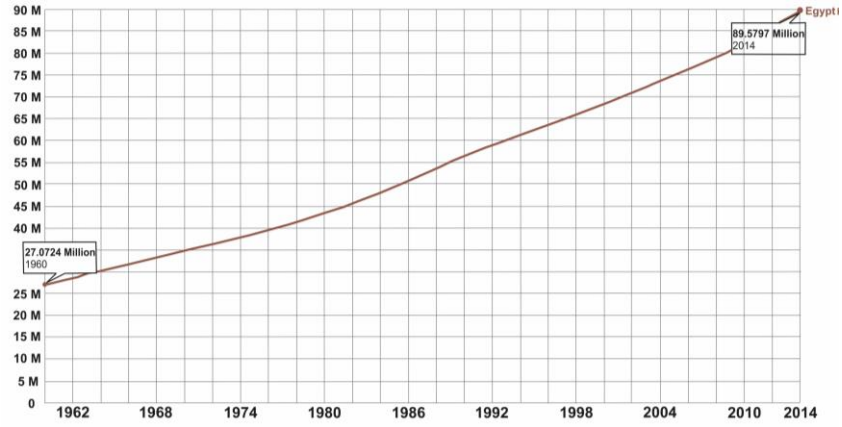

Fig. 4 – The population of Egypt: Midyear estimates of the resident population.
Source: World Bank Database.

Fig. 5 – The urban Population of Egypt: Midyear estimates of the resident population.
Source: World Bank Database.

Like many other countries in the world, Turkey has experienced a period of rapid urbanization. An increase in population growth, together with the rise in rural-urban migration, created a boom in demand for urban settlement. Located at the crossroads of Europe and Asia, Turkey occupies 783,562 sq. km: 755,688 sq. km. in southwest Asia and 23,764 sq. km. in Europe. The territory of the country is more than 1,600 km long and 800 km wide. Turkey has 81 administrative provinces and each province is divided into districts. There are 923 districts in Turkey. The largest city of Turkey, which is the largest city of Europe in terms of population, is Istanbul. Table 2 shows the six most populous cities of Turkey and their corresponding population. Nearly half the urban population of Turkey live in these six most populated cities (for largest cities and population density of Turkish regions see Figs 6 and 7).

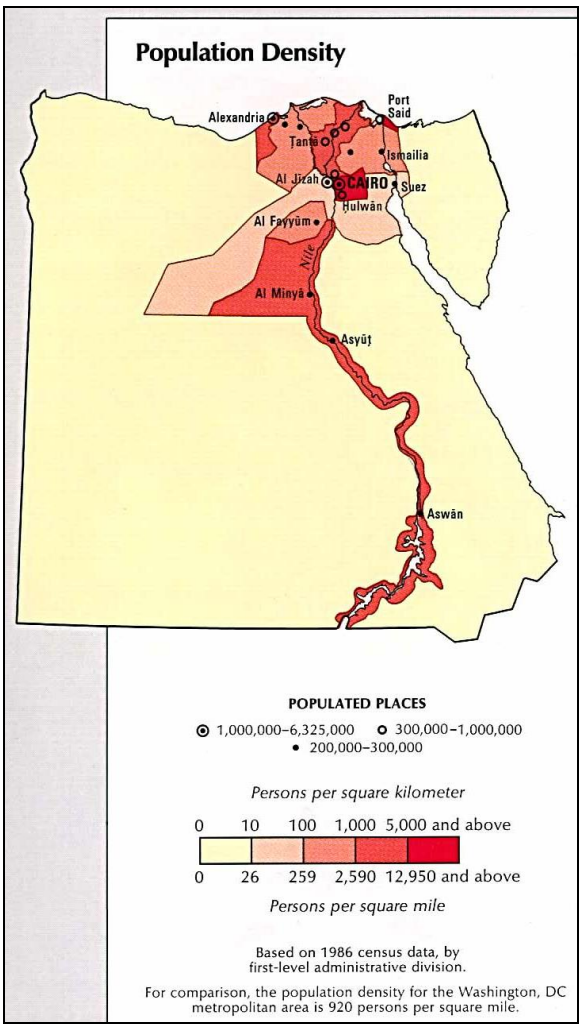

Fig. 6 – The largest cities and population densities of Egypt in 1986.
Source: Atlas of the Middle East (1993), U.S. Central Intelligence Agency, available on the website of The University of Texas at Austin Libraries.

Table 2

The population of the six most populous cities of Turkey. December 2013 address-based calculation of the Turkish Statistical Institute.

Rank	Name	Province	Pop.
1	Istanbul	Istanbul	13,820,334
2	Ankara	Ankara	4,474,305
3	Izmir	Izmir	2,828,927
4	Bursa	Bursa	1,769,752
5	Adana	Adana	1,645,965
6	Gaziantep	Gaziantep	1,465,019

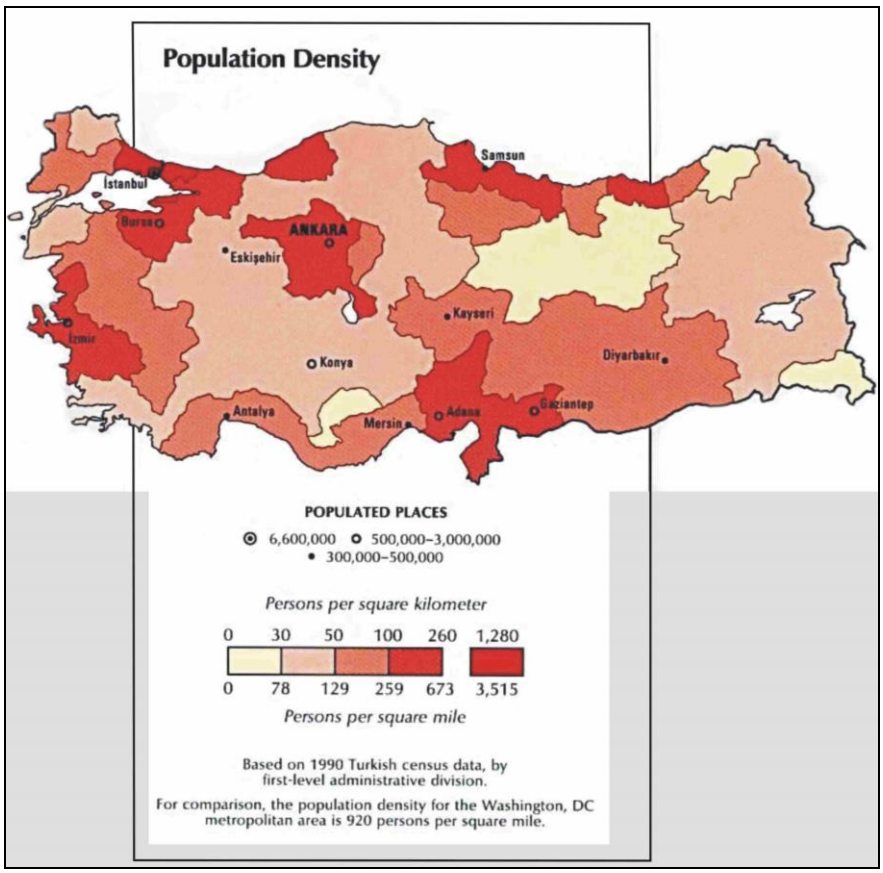

Fig. 7 – The largest cities and population densities of Turkish regions in 1990.
Source: U.S. Central Intelligence Agency available on the website of The University of Texas at Austin Libraries.

The line graph in Figure 8 shows that Turkey had a continuous growth of population in the period of 73 years. It changed from 27,55 million in 1960 to 75,93 million in 2014. According to the 2011 estimate, the population is increasing by 1.35 percent each year. The share of population living in urban areas increased dramatically in Turkey in the past decades. Data shows that Turkey experienced a breaking point in urbanization in the 1950s. The urbanization rate was around 17 percent from the foundation of the Republic (1923) until the early 1950s (Keleş, 2006). The urban population increased from 24.8 percent in 1950 to 69.6 percent in 2010, and is estimated to reach 84 percent in 2050 (UNPD, 2007). This was more obvious in the metropolitan cities of Turkey, like Istanbul, which experienced an enormous rise in its population after 1950 (Terzi & Kaya, 2008).

Figure 9 shows that the urban population increased from around 8.7 million in 1960 to 55.3 in 2014. The graph shows that 55.3 million of the total of 74.93 million people of Turkey live in urban areas, which is roughly 74 percent of the population, this number was around 31 percent in 1960. In the 1950 – 1980 period, due to an import-substitution development interval, people moved from smaller cities and rural areas to metropolitan cities due to the labour requirements of the industrial era (Altinok & Cengiz, 2008). Internal migration from rural areas to Istanbul made the city's population four times larger between 1975 and 2005 (TUIK, 2007).

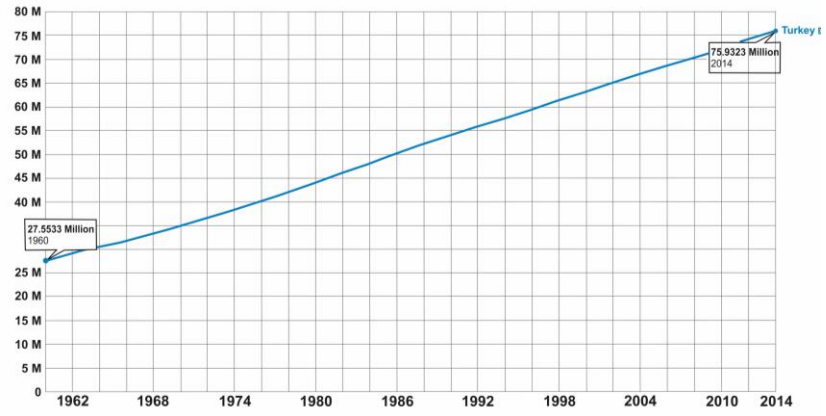

Fig. 8 – The population of Turkey: Midyear estimates of the resident population.
Source: World Bank Database.

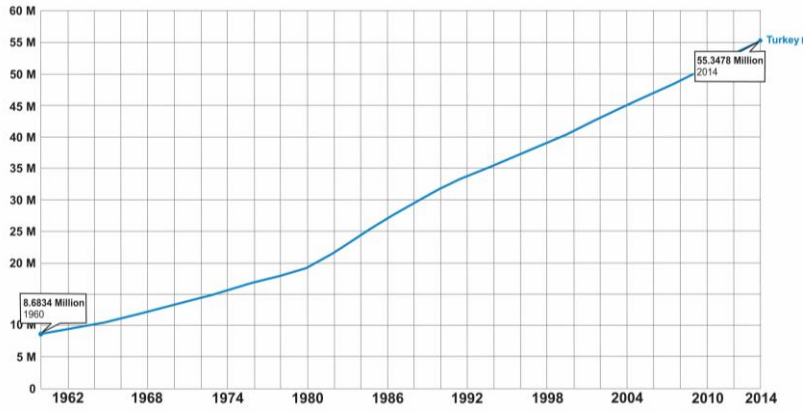

Fig. 9 – The urban population of Turkey.
Source: World Bank Database.

According to World Bank data, the urban population growth rate was 4.34% in 1960 and reached its maximum level, 6.2%, in 1981, dropping to 2.3% in 2014. The country ranked third among the countries with the highest urbanization rates in the world over 1980 –2000, as reported by World Bank data (TOKI, 2008).

5. DISCUSSIONS

This section explains and discusses some of the effective urban planning policies, or trends that were going on in parallel with changes in urbanization rates. Figure 10 illustrates the urban population growth rate from 1960 to 2014. According to the data, Turkey had the highest rate of urban population growth in 1982, with 6.26 percent growth in its urban population in the studied period. Iran reached its maximum in 1983, with 5.52 percent and Egypt in 1960 with 4.42 percent of urban population growth. All the three countries have a decreasing trend in urban population growth, which can be further explained by the lower rate of their population growth.

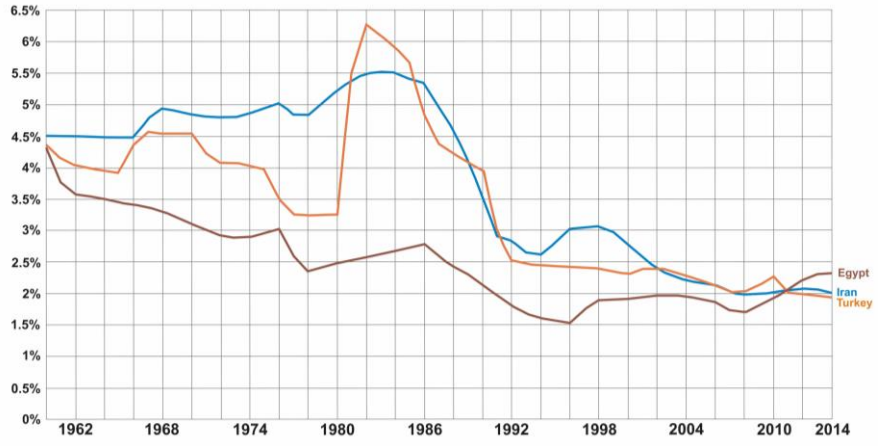

Fig. 10 – Comparison of urban population growth rate in Iran, Egypt, and Turkey, 1960–2014.
Source: World Bank Database.

In Iran, after three years of almost steady urban population growth rate around 3.2 percent (1977-1980), a dramatic jump in the growth rate was observed in 1981, with a 5.49 percent growth rate in urban population, a maximum reached being in 1982. Iran and Turkey had almost very close trends, while Egypt differed from them, yet with no huge ups-and-downs, its urban population growth rate staying always below that, the of two other countries until 2011 (Fig. 10).

The population growth rates of Iran and Turkey indicate similarities. Both experienced a peak growth rate in the early 1980s. In Iran, it happened just after the 1979 revolution, when governmental propaganda against population control and an improved healthcare system, on the one hand, and housing policies encouraging young couples to live in their self-built residential units on mass-sold lands on the periphery of the cities, on the other hand, seem to be some of the causes. The wholesale land selling program, was in force between 1979 and 2003, during which 1.7 million residential units were built. However, the most important era of this national policy occurred between 1981 and 1989. Rich in natural resources and fertile lands, Iran enjoys different climates and environmental conditions, ideal for agricultural activities. Prior to 1965, Iran had strict land-use policies, but since then, when an Active Economic Program based on oil incomes was initiated, it experienced a rapid growth of urbanization that converted thousands of acres of fertile lands into urbanized areas. Between 1975 and 1985, Iran had a 27 percent increase in its urban areas, which were mainly built up on croplands (Bigdeli, 2004). Over the last 50 years, the Iranian cities have expanded horizontally, creating unplanned and low-density residential patterns.

The same pattern of a jump in the population boom like in Iran was observed in Turkey in the early 1980s. As illustrated earlier in Fig. 11, Turkey did experience a population boom. Later on the necessity for population control became obvious, i.e. back in the 1990s, population control was considered to be one of the bases for the consolidation of democracy in Turkey along with secularism, bureaucratic reform, market privatization, government decentralization, good income distribution, etc. (Ergüder, 1995)

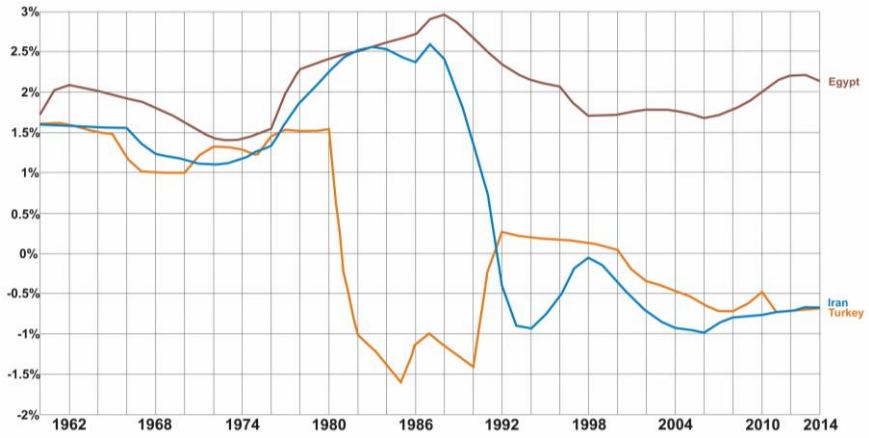

Fig. 11 – Comparison of rural population growth rate in Iran, Egypt, and Turkey, 1960–2014.
Source: World Bank Database.

As Figures 4 and 5 show, the increase in population and of the urban population in Egypt was steadier than in Iran and Turkey. Nevertheless, the fast decrease of population rates happened in the late 1980s in all of the three countries. Apart from the policies to urban planning, discussed throughout this paper, the political and societal turning points such as the Iran-Iraq war, political unrest in Turkey in the early 1980s and the like, seem to be influential in the drop of urban fertility rate. There clearly a delay before a demographic response after influential events comes. Political events like the Arab Spring and revolution of 2011 in Egypt, as well as migration from rural and urban settlements of western Iran to the central cities during the war have also had considerable effects on the increase of urban population. However, this does not mean that the role of political events can be overestimated, while there is a lot to several of evidence of mismanagement in the urban planning of the region that probably led to changes in urbanization rates. In Egypt, a relatively different trend can be observed, with the percentage of urban and rural population fluctuating around 43% and 57%, respectively since the 1980s. In 2014, Egypt had 50.9 million rural population (Fig. 12) and 38.5 million urban population (Fig. 5).

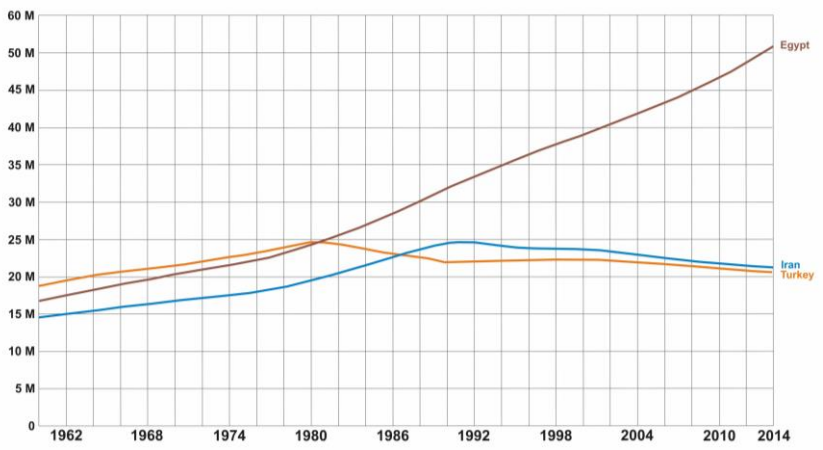

Fig. 12 – Comparison of rural population in Iran, Egypt, and Turkey, 1960–2014.
Source: World Bank Database.

The three countries had almost a very similar trend before 1980, and after that data Egypt's population trend would change. While in Iran and Turkey we see a decreasing rural population, in Egypt we have a relatively sharp increase in rural population. This divergence can be ascribed to the peculiar definition for "urban" in Egypt, it being interlinked with a spatial hierarchy rather than a population threshold, in other words, areas encompassing 10,000 inhabitants and more in some cases, are still considered rural. Such an approach has confined the urban population to almost the same geographical boundaries for decades (Zohry, 2002; Sims, 2012, 30-31). Indeed, if all areas encompassing 10,000 inhabitants or more were to be recognized as urban areas like in many countries, the trend of Egypt would have been closer to Iran and Turkey.

As a result of fast-againg urbanization between1960 and 2014, Turkey faced a drastic rise in demand for urban housing and due to government failure and the lack of effective policies, illegal settlements were formed. Low-income people, who migrated to the metropolitan cities mainly as labourers, built Gecekondus (which means ''landed overnight'' in Turkish). These were informal buildings, built illegally on government-owned lands or private lands, invading water basins, high quality agricultural lands and forests, historical and green protected areas. (Bolen *et al.*, 2007; TOKI, 2008; Uzun *et al.*, 2010) Over time, Gecekondus turned into 'squatter towns' on the fringe of urban areas. (TOKI, 2008) Later on, these areas merged into the cities and became part of city centers in the process of urban sprawl (Kaya & Zengel, 2005). These illegal constructions became one of the biggest challenges for the Turkish government. Studies suggest that the main drives behind urban sprawl in Turkey can be the growth-rate of population coupled with rural-urban migration and lack of effective policies, which led to the formation of illegal settlements and "squatter towns" that later merged into the cities.

There is notable evidence in the literature that the Turkish cities had been sprawling during the past decade. Apart from the majority of studies that cover the causes, consequences and evidence of urban sprawl in large Turkish metropolitan areas, like Istanbul (Altinok & Cengiz, 2008; Bolen *et al.*, 2007; Demiroz, 2005; Geymen & Baz, 2008; Kucukmehmetoglu & Geymen, 2009; Terzi & Kaya, 2008, 2011) Izmir (Egercioglu & Yalciner, 2013; Hepcan *et al.*, 2012; Kaya & Zengel, 2005; Kurucu & Chiristina, 2008; Park *et al.*, 2014), Ankara (Babalik-Sutcliffe, 2008; Çamur & Yenigül, 2009; Ercoskun, 2013, 2013; Özler, 2012; Sezgin & Varol, 2012), Mersin (Beyhan *et al.*, 2012), Aydin (Esbah, 2007), there are few studies which evidence urban sprawl and land-use changes in mid-sized cities of Turkey, like Kahramanmaraş (Doygun, 2009; Doygun *et al.*, 2008), Samsun (Güler *et al.*, 2007) and Trabzon (Sancar *et al.*, 2009). This happened when the rate of Turkish urbanization was smoothly decreasing.

A driver of jumps and the fallowing drop in urban population rates from 1960s to the end of the 1980s was the failure of urban policies, together with socio-economic phenomena, to prevent rural-urban migration. There are numerous studies in English and Persian about the circumstances and reasons behind this population displacement in Iran. Rural-urban migration occurred in Iran because of unemployment-induced poverty in rural areas (Fanni, 2006; Ziari, 2006). Interestingly, this time period coincided with the rapid sprawl of cities, such as it happened in Yazd, a city in the centre of Iran, from 1981 to 2001, and resulting in a 2.85 time area growth rather than population growth (Masoumi, 2014). Today, almost half of the population of this city has been the outcome of inward migration (Zanganeh Shahraki *et al*., 2011).

Rural-urban migration in Turkey (between 1950 and 1980) was due to an import-substitution development period, people moving from smaller cities and rural areas to metropolitan cities due to

labour demand in the industrial era (Altinok & Cengiz, 2008). Internal migration from rural areas to Istanbul led to a four-time population increase between 1975 and 2005 (TUIK, 2007).

Egypt tried to provide housing under a new large-city development program. Egyptian new desert cities were elaborated as a long-term solution to accommodate the overflow of population of large cities during the past decades. The plan failed to provide affordable housing for the lower-income class, while by contrast, the wealthiest quantiles of Egyptians, as well as a part of the middle class were willing to move to these new cities (Metwally & Abdalla, 2011). Table 3 illustrates the new cities around Cairo. As seen in the table, numerous new cities were planned and built only around Greater Cairo, most of which failed to attract the middle-to-average class new residents. Back in 1991, twenty percent of Cairo was spent in these satellite cities (Dorman, 2013).

Table 3

New desert Cities near Cairo according to NUCA website data. Source: NUCA, 2014.

	Generation	City Name	Distance	Total Area in thousand feddans	Urban area (i.e. in thousand feddans	Current population in thousand capita	Population Targeted In thousand capita	Target Year	Targeted Density on Total Area (Capita / Feddan)
1	1st	10th Ramadan	49 km east of Cairo	94.80	80.00	430	2,300	2032	24
2	1st	15th of May	35 km south–east of Cairo	12.231	4.715	200	500	unkn	41
3	1st	Al-Sadat	93 km north–west of Cairo	119.00	23.700	155	1,000	unkn	8
4	1st	6th of October	17 km from the pyramids area in Al-Giza	119.20	61.500	1,350	6,000	unkn	50
5	1st	New Borg ElArab	60 km from Alexandria city	47.403	26.718	150	570	unkn	12
6	1st	New Damiatta	4.5 km from Damiatta port	6,500.00	6.50	135	500	2027	77
7	1st	New Salhya	40 km from Ismailia city	1.60	1.60	40	80	2022	50
8	2nd	Al-Ubur	9 km from Cairo	32.40	16.00	300	600	2017	19
9	2nd	Badr	47 km south–east of Cairo	18.545	14.20	85	840	unkn	45
10	2nd	New Bany Sewef		37.90	5.486	62	268	2017	7
11	2nd	New Nubaria	79 km from Alexandria city	1.816	1.816	22	80	unkn	44
12	2nd	New Menia		24.90	4.80	40	157	2050	6
13	2nd	New Cairo	10 mm from Nasr city district in Cairo	70.00	70.00	1,200	6,000	unkn	86
14	2nd	Al-Sheikh Zayed	Close to the pyramids area in Al-Giza	10,400.00	10.00	233	675	unkn	65
15	2nd	Al-Shuruq	37 km east of Cairo	11.90	9.20	170	500	unkn	42
16	3rd	New Aswan	12 km to the west of Aswan city	10.20	3.20	0.060	70	2017	7
17	3rd	New Assiut	15 km from Assiut city	30.30	6.642	25	750	unkn	25
18	3rd	New Taiba	14 km north–east of Luxor city	9.521	2.421	15	195	unkn	20
19	3rd	New Sohag	18 km from Sohag city	30.80	7.00	0	420	2050	14
20	3rd	New Fayom	15 km from Fayom city	13.50	1.669	0	100	unkn	7
21	3rd	New Qena	8 km from Qena city	24.20	7.00	0	130	unkn	5
22	3rd	New Akhmim		34.868	3.037	0	unkn	unkn	
Total				**761.98**		**4,612.06**			Avg. den.= **30**

The findings of this study-case show how failed planning practice coincide with change in urban population. The theoretical value of this study consist in its exemplifying what previous scholars, like Lavalle *et al.* (2001) addressed the linkages between false urban planning and urban population growth in developing countries. The lack of coupling population increase, land-use and housing, the absence of affordable housing, urban shrinkage, informal settlements, etc. was shown to lie at origin of urban problems in some of these countries (Hope & Lekorwe, 1999). Some of these phenomena, such as rural-urban migration, as well as informal settlements have been identified as a failure of urban policy in some of the developing countries to cope with fast-going urbanization (Awumbila, 2014). When looking at previous large-scale practices, it is difficult to have an overall evaluation of their success. Whether planning practices in developing countries have led to resilient habitats, or failed to stop unwanted trends, can be assessed primarily by investigating unwanted trends like fast-going urbanization. This study tries to fulfill this basic gap.

6. CONCLUSIONS

The three target countries had the same fertility rate in 1960. After decades of political conflicts and housing/planning trial and error that had significantly increased rates in Iran and Turkey in the early 1980s, the rate of population increase in the three countries come to be nearly equal in 2014. The interesting point is that after 2011, the urban inhabitants' increase rate in Egypt topped that of Iran and Turkey.

This paper examines the urbanization rates of the region with respect to the national urban planning strategies. According to this analysis, the coincidence of the unsuccessful planning and housing strategies, which were mostly reactions to the public attitude urbanization, are worth being investigated. Some of these planning failures, like large-scale plans aiming at creating new cities in Iran and Egypt, or wholesale land selling to inward migrants to build personal houses in Iran and Egypt are vis-à-vis planning practices done on a very large scale, missing preparatory supporting studies to assess the societal impacts. Some other urban phenomena, that occurred in parallel with fast-going urbanization, were unplanned patterns not strategized by the planning systems. The example of such phenomena is suburban and urban sprawl and dispersal of cities in the absence of powerful control of urban planning organizations. Finally, the third group of trends are larger than the above ones; nation-wide processes that urban planning can have limited effects on, while a wide range of reasons cause the emergence of such large-scale challenges. Uncontrolled rural-urban migration is one of these challenges that only is caused not by deficient urban planning, but also by the absence of efficient urban planning and governance, caused socio-economic and cultural problems in the cities of the region.

For future research-work, causality and its direction would be intriguing. Firstly, it is interesting to know whether urbanization has occurred because of socio-economic and lifestyle changes, which urban planning tried to interfere with, or if urbanization has been accelerated by the failures of Middle Eastern urban planning. It is also significant to know what negative or positive, impacts planning-decisions have made on urbanization rates, and in what way.

The lack of resources, such as possibilities for the researchers of the region to carry out a common work, is among the limiting factors of this study and the like. Since the authors of this study had the opportunity to work with one another for a short time, a primary descriptive work, which is presented in this paper, could be done. The nature of this study is purely descriptive, and can be

completed by more complicated approaches like statistical modeling, longitudinal analyses, expert interviews, etc. Quantification of housing and urban policies by expert interviews and bringing them into longitudinal models with dependent variable of urban population can produce further interesting results.

REFERENCES

Abu-Lughod, J.L. (1965), *Urbanization in Egypt: present state and future prospects*, Economic Development and Cultural Change, **13**, pp. 313–343.

Aliakbari, E. (2004), *Urban development and social pathology in Iran*. Geographical Research Quarterly, **48**, pp. 49–70.

Altinok, E., Cengiz, H. (2008), *The effects of urban sprawl on spatial fragmentation and social segregation*, in: Istanbul. Proceedings of the 44th ISOCARP Congress.

Awumbila, M. (2014), *Linkages between urbanization, rural–urban migration and poverty outcomes in Africa*, Background paper, International Organization for Migration (IOM).

Azizi, M.M. (2009), *Density in Urban Planning principles and criteria for Density Determination*, Tehran University Publication.

Babalik-Sutcliffe, E. (2008), *Urban planning for sustainability: Ankara's planning experience in creating sustainable urban form and transport*, Presented at the The First International Symposium on Transportation and Development – Innovative Best Practices (TDIBP 2008).

Beyhan, B., Taubenböck, H., Suffa, S., Ullman, T., Rauh, J., Dech, S. (2012), *Urban growth and sprawl of Mersin City, Turkey: change analysis based on earth observation and socio-economic data*. Megaron Architecture, **7**(*1*), pp. 3–26.

Bhatta, B., Saraswati, S., Bandyopadhyay, D. (2010), *Urban sprawl measurement from remote sensing data.* Applied Geography, **30**(*4*), pp. 731–740.

Bigdeli, D. (2004), *Regularizing informal settlement, case study: Koy-e Fatemieh in Zanjan City*. Master thesis, Zanjan University.

Bolen, F., Türkoğlu, H., Ergun, N., Yirmibeşoğlu, F., Terzi, F., Kaya, S., Kundak, S. (2007), *Quality of residential environment in a city facing unsustainable growth problems: Istanbul*, in: Joint Congress of the European Regional Science Association and the Association de Science Régionale de Langue Française, Paris, August/September.

Brueckner, J. K. (2000), *Urban sprawl: diagnosis and remedies*. International regional science review, **23**(*2*), pp. 160–171.

Brueckner, J.K., Kim, H.A. (2003), *Urban sprawl and the property tax*, International Tax and Public Finance, **10**(*1*), pp. 5–23.

Çamur, K.C., Yenigul, S.B. (2009), *The rural–urban transformation through urban sprawl: an assessment of Ankara metropolitan area*, in: The 4th International Conference of the International Forum on Urbanism (IFoU). Retrieved From: http://www.ifou.org/conferences/2009delft/proceedings/7%20The%20New%20Metropolitan%20Region/E016_Sevinc%20Bahar_Yenigul_TheNewUrabanQuestionForm.pdf.

Demiroz, Z. (2005), *The applications of New Urbanist communities in Istanbul, Turkey: a success of a failure?*, Cornell University.

Dorman, W. (2013), *Exclusion and informality: the praetorian politics of land management in Cairo, Egypt*. International Journal of Urban and Regional Research, **37**, pp. 1584–1610.

Doygun, H. (2009), *Effects of urban sprawl on agricultural land: a case study of Kahramanmaraş, Turkey*, Environmental Monitoring and Assessment, **158**, pp. 471–478.

Doygun, H., Alphan, H., Gurun, D.K. (2008), *Analysing urban expansion and land use suitability for the city of Kahramanmaraş, Turkey, and its surrounding region*, Environmental Monitoring and Assessment, **145**, pp. 387–395.

Egercioglu, Y., Yalciner, S. (2013), *Impacts of Rail Transportation Projects on Urban Areas in Izmir-Turkey*, in: Proceedings of World Academy of Science, Engineering and Technology. World Academy of Science, Engineering and Technology (WASET), pp. 500.

Erçoşkun, Ö.Y. (2013), *Successes and failures in urban development of Ankara*. Iconarp International Journal of Architecture and Planning, **1**, pp. 132–151.

Ergünder, Ü. (1995), *The Turkish system and the future of the Turkish democracy*. In Balim, G., Kalaygioglu E., Karatas C., Winrow G., Yasamee F., Turkey: Political, Social and Economic Challenges in 1990s, E. J. Brill, Leiden, The Netherlands, pp. 61–72.

Esbah, H. (2007), *Land use trends during rapid urbanization of the city of* Aydin, Turkey, Environmental Management, **39**, pp. 443–459.

Ewing, R. (1997*). Is Los Angeles-style sprawl desirable?* Journal of the American planning association, **63**(*1*), pp. 107–126.

Ewing, R., Pendall, R., Chen, D. (2002), *Measuring sprawl and its impact: The character and consequences of metropolitan* expansion, Washington, DC: Smart Growth America.

Fanni, Z. (2006), *Cities and urbanization in Iran after the Islamic revolution*, Cities, **23**, pp. 407–411.
Geymen, A., Baz, I. (2008), *Monitoring urban growth and detecting land-cover changes on the Istanbul metropolitan area*, Environmental Monitoring and Assessment, **136**, pp. 449–459.
Güler, M., Yomralıoğlu, T., Reis, S. (2007), *Using landsat data to determine land use/land cover changes in Samsun, Turkey*. Environmental Monitoring and Assessment, **127**, pp. 155–167.
Harvey, R.O., Clark, W.A. (1965). *The nature and economics of urban sprawl,* Land Economics, **41**(*1*), pp. 1–9.
Hepcan, S., Hepcan, C.C., Kilicaslan, C., Ozkan, M.B., Kocan, N. (2012), *Analyzing landscape change and urban sprawl in a Mediterranean coastal landscape: a case study from Izmir, Turkey*. Journal of Coastal Research, **29**, pp. 301–310.
Hope, K.R., Lekorwe, M.H. (1999), *Urbanization and the environment in Southern Africa: towards a managed framework for the sustainability of cities*, Journal of Environmental Planning and Management, **42**, pp. 837–859.
IDSC, n.., T. E. C.-. I. a. D. S. C. (2014), *Egypt's information portal* [WWW Document], Retrieved From: http://www.eip.gov.eg/ DataDirectories/AdministrativeDivision.aspx.
Iranian Statistic Centre (2012), *Population Census 2012*, Iran Statistical Yearbook, Tehran, Iran.
Kamrava, S.M.A. (2007). *An introduction to the contemporary urbanism in Iran 1963–2003,* Tehran University Publication.
Kaya, İ., Zengel, R. (2005), *A marginal place for the Gypsy community in a prosperous city*, Cities, **22**, pp. 151–160.
Keleş, R. (2006), *Urbanization policy*, Ninth Edition. DJmge Kitabevi, Ankara.
Khalifa, M., DaVanzo, J., Adamson, D. (2000), *Population Growth in Egypt: A Continuing Policy Challenge.* Santa Monica, CA: RAND Corporation. Retrieved From: http://www.rand.org/pubs/issue_papers/IP183.html.
Kucukmehmetoglu, M., Geymen, A. (2009), *Urban sprawl factors in the surface water resource basins of Istanbul*. Land Use Policy, **26**, pp. 569–579.
Kurucu, Y., Chiristina, N.K. (2008), *Monitoring the impacts of urbanization and industrialization on the agricultural land and environment of the Torbali, Izmir region, Turkey*, Environmental Monitoring and Assessment, **136**, pp. 289–297.
Lavalle, C., Demicheli, L., Turchini, M., Casals Carrasco, P., Niederhuber, M. (2001), *Monitoring mega-cities: the MURBANDY/MOLAND approach*, Development in Practice, **11**, pp. 350–357.
Margo, R.A. (1992), *Explaining the postwar suburbanization of population in the United States: The role of income.* Journal of urban economics, **31**(*3*), pp. 301–310.
Masoumi, H.E. (2014), *Urban sprawl in mid-sized cities of MENA, evidence from Yazd and Kashan in central Iran*, Management Research and Practice, **6**(*2*), pp. 25–41.
Metwally, M., Abdalla, S.S. (2011), *Impact of Gated Communities On The Urban Development Of New Cities In Egypt*, Cairo: The Center for Planning and Architectural Studies (CPAS).
Movahed, K. (2004), *A study on the dwindling of Shiraz green areas*. In Proceedings of 40th ISoCaRP congress, pp. 18–22.
New Urban Community Authority (NUCA) (2014), Accessed September 2014. Retrieved From: http://www.newcities.gov.eg/english/New_Communities/default.aspx.
Özler, Ö.A. (2012), *The role of urban planning in urban sprawl: the South-Western periphery Of Ankara*. AESOP 26th Annual Congress.
Park, S., Hepcan, Ç.C., Hepcan, Ş., Cook, E.A. (2014), *Influence of urban form on landscape pattern and connectivity in metropolitan regions: a comparative case study of Phoenix, AZ, USA, and Izmir, Turkey*, Environmental Monitoring and Assessment, **186**, pp. 6301–6318.
Robson, J., Ayad, H., Wasfi, R., El-Geneidy, A. (2012), *Spatial disintegration and arable land security in Egypt: a study of small- and moderate-sized urban areas*, Habitat International, **36**, pp. 253–260.
Sancar, C., Turan, S.Ö., Kadioğullari (2009), *Land use-cover change processes in Urban fringe areas: Trabzon Case Study, Turkey*, Scientific Research and Essays, **4**, pp. 1454–1462.
Sezgin, D., Varol, C. (2012), *The effects of urban growth and sprawl on the misuse of fertile agricultural lands in Ankara*, METU Journal of the Faculty of Architecture, **29**, pp. 273–288.
Shaalan, I. (2013), *Sustainable urban transformation in small cities in Egypt: a UN-Habitat perspective*, Journal of Cleaner Production, **50**, pp. 200–204.
Shahraki, S.Z., Seifolddini, F., Pourahmad, A. (2012), *Urban sprawl and fertile agricultural lands in Iranian cities – case study: Tehran and Karaj*. Journal of Civil Engineering and Architecture **6**(*2*) (Serial No. 51), pp. 204–210. Retrieved From:
Sims, D. (2012), *Understanding Cairo: the logic of a city out of control*, The American University in Cairo Press; Reprint edition (September 15, 2012).
Terzi, F., Kaya, H.S. (2008), *Analyzing urban sprawl patterns through fractal geometry: the case of Istanbul Metropolitan Area*. (CASA Working Papers 144). Centre for Advanced Spatial Analysis (UCL): London, UK.
Terzi, F., Kaya, H.S. (2011), *Dynamic spatial analysis of urban sprawl through fractal geometry: the case of Istanbul*, Environment and Planning-Part B, **38**, pp. 175–190.
TOKI (2008), *Erzincan urban renewal (Gecekondu transformation) project of Turkey*, application document to the best practice Dubai award, Republic of Turkey Prime Ministry Housing Development Administration, Ankara, Turkey.
TUIK (2007), *Population Census 2007*, Turkish Statistic Institute, Ankara.
UN Habitat (2008), *State of the world's cities 2008/2009: harmonious cities*. Earthscan, London. (p. 24).

UNPD (2007), *World urbanization prospects: The 2007 revision population database*, United Nations Population Division, Department of Economic and Social Affairs. Brussels, Belgium.
Uzun, B., Çete, M., Palancıoğlu, H.M. (2010), *Legalizing and upgrading illegal settlements in Turkey*, Habitat International, **34**, pp. 204–209.
World Bank (2015), *World population prospects: the 2015 revision*, United Nations.
Zanganeh Shahraki, S., Hosseini, S.M. (2009), *Evaluation of the role of urban management instituion of Iran after the Islamic revolution in physical development of cities*. Shahrdariha Magazine, **9**, pp. 26–31.
Zanganeh Shahraki, S., Sauri, D., Serra, P., Modugno, S., Seifolddini, F., Pourahmad, A. (2011), *Urban sprawl pattern and land-use change detection in Yazd, Iran*, Habitat International, **35**, pp. 521–528.
Ziari, K. (2006), *The planning and functioning of new towns in Iran*. Cities, **23**, pp. 412–422.
Zohry, A. (2002), *Rural-to-urban labor migration: A study of upper Egyptian laborers in Cairo*. Ph.D. dissertation, University of Sussex, Brighton.
http://www.davidpublishing.com/davidpublishing/Upfile/8/16/2012/2012081667619745.pdf.

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LOCAL COMMUNITIES INVOLVED IN THE TERRITORIAL PLANNING OF SOUTH-BUKOWINA AREA. FACTOR AND EFFECT

DRAGOŞ BAROIU[*], PAUL-RĂZVAN ŞERBAN[**]

Key-words: territorial planning, local community, Bukowina.

Abstract. Even though all of Bukowina has no longer functioned as a territorial system in itself, yet it has preserved much of the characteristic features of an aggregate whole, standing apart by a certain way of life, humanized landscape and the behaviour of its population. Therefore, we have deemed it useful and important to undertake such a study on the relationship between local specificity and territorial organization, a prerequisite for the implementation of efficient local and regional development policies.

1. INTRODUCTION

Despite the progress made by research on how to structure the geographical space, this notion remains a most controversial one. What is known for certaint is that Human Geography studies man and space in their respective geographical space. In fact, geographical space is the subject of Geography as a whole, hence the need to redefine the essential concept of research in this field. A synthetic approach to geographical space could define it as a spatial projection of interdependencies between all of the geographical components (Ianoş and Heller, 2006). The systematic analysis of a space, in terms of its organization and planning, contains references to the organization and planning of its major components, which act as aggregates of features and functions. In view of it, among the primary tiers we must consider the built area, with functional areas, and unincorporated areas, with specific uses and functions, such as facilities for agriculture, forestry, transport and tourism, as well as waste disposal as intrinsic parts (Ianoş, 1990).

The other territorial planning levels down to the smallest analysed unit could be of interest to the researcher, provided they reflect maximum interconditionalities (Ianoş, Popescu, 1997). In this case, the household becomes a common point of reference, transposing physically, through configuration, appearance and role, the whole arsenal of natural favourability and restrictions, as well as the rules, habits and beliefs of the community (Barbu, 1976). Even if the principles of planning the geographical space are still the same, there are many peculiarities leading to the idea that local planning is essential to detecting the geographical macrosystem's structure and functioning in order to individualize the strong imbalances occurring at planetary level.

2. TERRITORIAL PLANNING OF SOUTH-BUKOWINA AREA

The validity of geographical analyses at the lower levels of geographical space taxonomy is supported by the possibility of detecting the direct effects of interventions. It is clear that only on limited and relatively homogeneous functional spaces, one can see how change is propagating from

[*] Researcher, Institute of Geography, Romanian Academy, 12 Dimitrie Racoviţă Street, 023993, Bucharest, RO-023993, baroiud@yahoo.com.

[**] Researcher, Institute of Geography, Romanian Academy, 12 Dimitrie Racoviţă Street, 023993, Bucharest, RO-023993; Lecturer, Faculty of Natural Sciences, Engineering and Computer Science, "Vasile Goldiş" Western University of Arad, Arad, Romania, paulrazvanserban@yahoo.co.uk.

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one component to another. Finding direct effects is relatively easy and allows for reorientation and resizing interventions, but estimating the cumulative effects of change on the structure and the individual components remains quite difficult. Therefore, it is necessary to correlate the results with the sets of events that occurred, under identical conditions, in the history of the same system, or of similar systems. After obtaining such information, we can proceed to redefining strategies and policies for correcting aberrant evolutions on the microscale.

Proceeding from the general features of the Romanian space, we might distinguish three types of mental spaces corresponding to three distinct space levels: macro-territorial (the historical provinces), mezzo-territorial (the historical lands) and micro-territorial (the locality of origin). In this hierarchy, Bukowina falls into the first category of mental spaces which individualizes Dorna Land and Câmpulung Land, circumscribed to depressions by the same name, as functional and mental spaces at mesoterritorial scale (Cocean, 1997).

As a whole, the individuality of the south-Bukowina area is shaped both by its distinct natural characteristics and social-historical specificities, differring from the rest of the Moldavian space (after 1774) rather by the spatial and functional homogeneity that stamped its residents'psyche of belonging to this space (lived space, perceived space) (Cocean, 2002).

Therefore, notwithstanding the natural heterogeneity and, hence, potential and habitat conditions, the south-Bukowina area is a relatively homogeneous functional space, different from the rest of Moldavia, a mental space perceived *per se* by the local communities. From this view-point, Bukowina has all the attributes of a regional entity bottom-up individualized through the associative participation of the local communities, which ensures the full functionality of the territorial whole. This individuality is projected in the residents' psyche, the region becoming a mental space, a space which residents refer their identity to, a space of communion between man and his life environment, a fundamental element in the sustainability of any spatial structure. Mental spaces are both functional spaces, and spaces of ethnic and cultural homogeneity; bottom-up structured spaces, based on the relationships between the local communities.

After 1918, Romania displayed three distinct administrative regions: the Old Kingdom (Wallachia and Moldavia), Bukowina, Bessarabia and Transylvania. Thus, in terms of surface-area, Bukowina counties were 7–10 times smaller than the neighbouring counties of Bessarabia, or some counties in Transylvania and Banat. The tasks of prefects and of other local administrative institutions were very different: e.g. the population of Bihar or Caras-Severin counties numbered over 450,000 inhabitants, while that of the Bukowina counties was more than 10 times less (around 25,000 inhabitants in Văşcăuţi), like a medium-sized city, governed by a mayor (Fig. 1).

Stages of territorial planning

Territorial planning in Bukowina covered three distinct periods:

– The **Middle Ages**: hearths type (Rom. *vatra*) (freemens' settlements – Rom. *răzăşesc* – Câmpulung, Vatra Dornei), Forest Reserve type (*branişte*[1]) (monasteries of Putna and Voroneţ), voivodal domain type (Suceava) (Iosep, 2009).

– **The Austrian period**: colonies, *slobozii*[2] and towns type,

– **The Post-WWII period**: private forms (in the mountain area) and state farms (in the plateau area).

Organizing natural systems is a continuous process and self-organization assimilated. The south-Bukowina area has evolved according to unique rules of self-regulation and microscale equilibrium with minimum human influence, low population density (the mountain region covering 65% of the south-Bukowina area), in a pastoral and agrarian society with reduced dynamic, capacity of adjustment and regeneration of the natural mountainous environment. The scheme of territorial planning is a simple one, including material and energy flows moving within two systems: a mountain

[1] Settlement where houses are built among rare and old trees tree-cutting being banned.

[2] Territory occupied and administered by a foreign state and dependent on it for administration, economy and culture.

system, with valleys and depressions and a plateau system, which is an ecologic system with biotic and abiotic circuits integrated into a fund of big water circuits and of dynamic geomorphology.

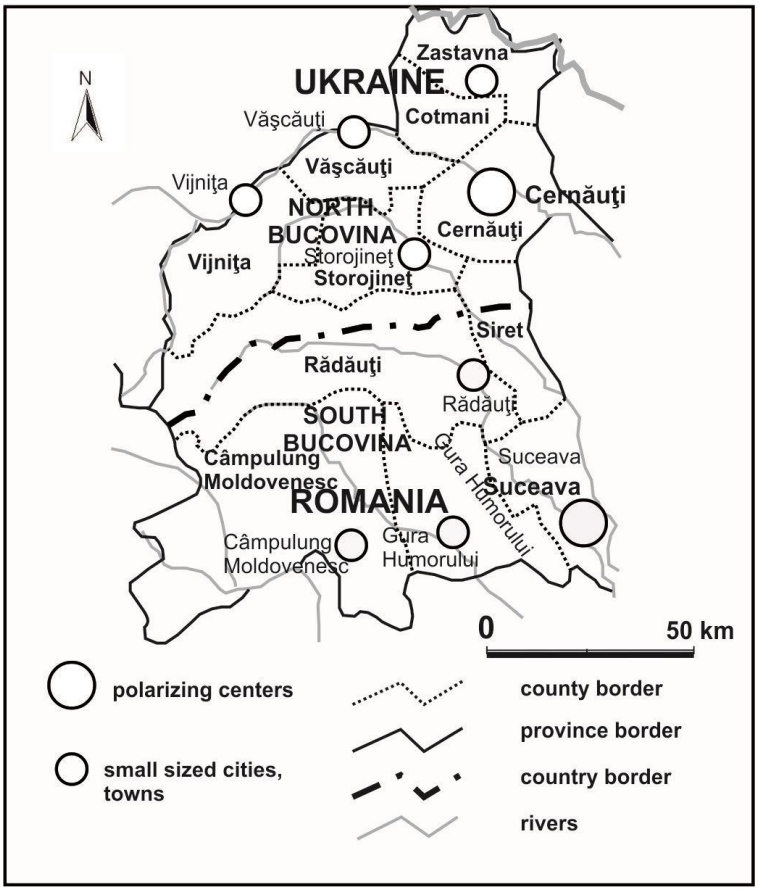

Fig. 1 – The administrative organization of Bukowina from 1925 to 1940 (after R. Săgeată, 2004).

Human communities were discreetly inserted, without causing major disturbances in the natural order, but subsequently, with the intensification and permanence of the human presence, the region was turned into a man-altered landscape, although the natural environmental footprint has remained visible and strong.

Territorial planning is a continuous process, becoming noticeable only on major thresholds. Given all the historical, economic, social and political changes, succeeding one another over the centuries, three stages of territorial planning have been identified in the south-Bukowina area based on constituent structures and dynamics.

2.1. The Middle Ages Stage (peripheral interferences – until 1774)

In an analysis of Mediaeval Times, there is the temptation to look for the forest range of the permanence and continuity of settlement within the entire Carpathian area and beyond, according to the leit motive which says that, in this part of the Continent, habitation dates from Ancient Times. Large spruce and beech woods were perceived as border area, rather than as habitat zones.

Frequently, in understanding territorial planning one resorts to the historical and political context, considering them essential prerequisites for modelling and boosting the space. The structural function of the political and historical factors can be found and manifest within the context of permanent housing scattered due to historical events (Chiriţă, 2005).

After the 13th century, the north-western part of Moldavia, still in its first stage of development, did experience faster population growth; however the hearth was not yet consolidated. Between the late 9th and 13th centuries, Petchenegs, Cumanians, followed by Taetar-Mongol tribes used to control the Carpathian valleys and passes. Justifying reduced population numbers, or even thew absence of settlements, was also the fact that is part of Moldavia was flat and larger than mountain area. Forests do, provide resources, but they did not provide the basis for lasting settlements, becaming a place of shelter or refuge only in hard times (Chiriţă, 2005).

Another important territorial planning element of the south-Bukowina area are some of the appellatives, e.g. land, which has many meanings today: state, motherland, province, region, county, territory (Oancea, 1979). Although considered minor today, the Romanian meaning of mountain country is the oldest, being regionally used as determinative for some Carpathian depressions (Dorna, Campulung), villages, crops, meadows, pastures and forests etc. In view of it, the continuity of settlement in such lowland areas becomes obvious (Iaţu, 1998).

Dorna Land corresponds to Dorna Depression and its mountainous surrondings. The term *land* is not used as a local appellative for Dorna region, the local meaning being of agricultural region rich in grain crops. Perhaps, given the toponymy (ex. Prisaca Dornei, at the eastern limit of Câmpulung), Dorna Depression was part of Câmpulung Country in the Middle Ages (Ilieş, 1999) (Fig. 2).

From an ethnographic viewpoint, one of the oldest types of household, with strengthened forest range (Rom. *ocol*) exists in the territory of small lands (Câmpulung). The geographical names found in old or new historical and cartographic documents, designated organizational entities of small or large, high or low lands. These names can be considered as part of the history and the national cultural heritage, being specific to the Romanian territory.

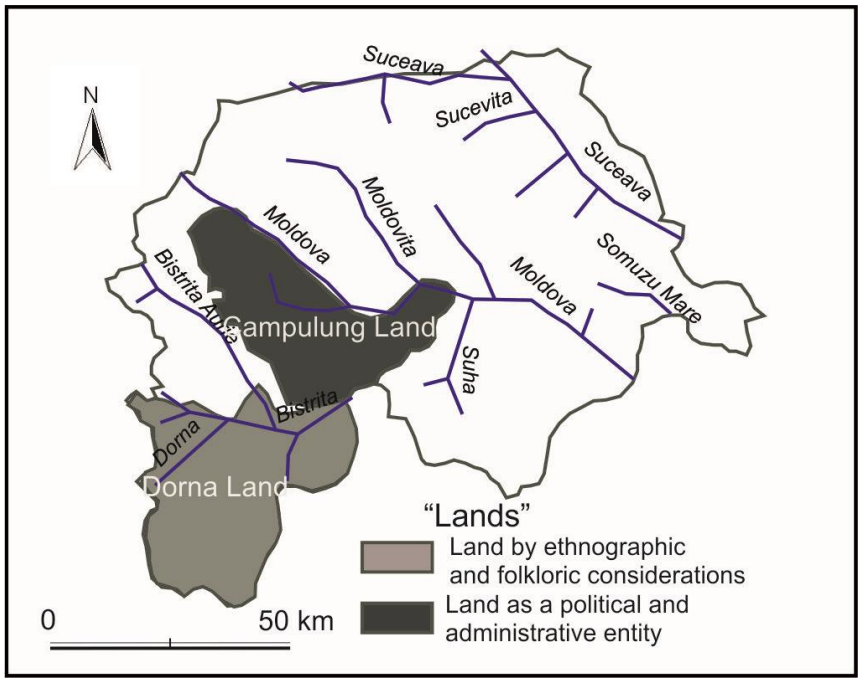

Fig. 2 – South-Bukowina – Types of lands.

As the valleys came to be more populated, or took on a polarizing function after the building of Voronet, Putna, Moldoviţa, and Suceviţa monasteries, the space was divided between the estates of these monasteries, with all the consequences deriving from their neighboarhood, e.g. boundary line, illegal use (Chiriţă, 2005). The falling of these estates into the possession of the monasteries was a gradual process, the first estates having belonged to the inhabitants of Câmpulung Forest Range (Rom. *ocol*), who already had a freemens' type of territorial planning (Rom. *răzăşesc*). This involved a typical process of deforestation and the introduction of portions of land into the agricultural circuit (Rom. *lăzuire*), either as cropping or as hay-fields. The right to deforest and become master of the deforested place was a very old custom, dating from the time when there was not Ruling Prince in the country to grant estates, the residents clearing forest areas and building houses for themselves. This custom dates to the time of Voivode Bogdan, was usually observed in certain regions of Moldavia, mostly in the mountains, where life was difficult and few people wished to live there. Deforestations, practiced by the peasants of Câmpulung, created areas used for house-building and remained peasants property under their control (Bălan, 1960). In the Middle Ages, the south-Bukowina area was organized according to outside influences, namely, monastic centeries and neighbouring free communities, which actually divided the space by centrifugal forces. The valleys became improper for lasting habitation. The internal planning of a territory, its administration, whether clerical or secular, can produce internal fractures, overlapping the natural convergent organization by a divergent one (see also Ianoş, 1994). Although the monastic boundaries, which cut the Bukovinian territory, did not always follow the same rule, they nevertheless had always been lines of separation between ownership and organizational systems.

To conclude, we would say that the Mediaeval sub-Bukowinian space had three forms of space organization: the freeholder's (the hearth), *branişte* (the forest belonging to the Church fonds), and the Princely feudal estate (belonging to the Princely Court).

2.2. The Modern (Austrian) Stage (1774–1918)

The Austrian presence in Bukowina, represented a hub of territorial planning. In the early years of Austrian occupation, the administration of the province of Bukowina was ensured by a military structure, shortly replaced by that of the Administrative District of Galicia. These entitles used to believe that we talk about an organizational framework in which various population and economic, religious, and administrative entities became integrated (Chiriţă, 2005).

That period was marked by the question of settling the borderline of the south-Bukowina area. This delimitation represents a departure from the Austrian-Turkish Map and from the agreement on the above-mentioned sector. Studying historical documents shows that the borderline with Moldavia set by the Austrian Empire, was advantageous for the latter.

North of this bordline, local organization reveals the actual implementation of planning and zoning policies. These are achieved through the introduction of a stable cadastre in 1879 (Chiriţă, 2005).

Demographically speaking, the numerical growth, due mostly to immigations, especially through incomings, led to the multiplication of permanent housing. However, that increase did not alter the general configuration of the settlement network which continued to preserve a punctual character. The flow of people allowed for the development of a local economy based on logging, shepherding and agriculture, limited to specific intra-montane or plateau crops.

As a consequence, villages appeared as small clusters of houses with links of communication between them, actually the beginning of a more intense humanization. Increased anthropization would manifest in the gradual change of land-use, greater housing densities, the mapping of new roads and the beginning of the exploitation of local mineral resources. All these elements were essential for a certain kind of territorial planning, both at provincial and local territorial level.

Forest areas continued to be the dominant structure of land resources despite the continuous territorial expansion of new villages. Planning attempts and administrative allocation were reflected in the creation of the first macro-regional structures, such as the Church Fund. These structures will posses a considerable area, especially forests, for a longer period of time, the Fund, consisting of the former monastic forest reserve, but also of the Forest Range of Campulung, or of other properties. Territorial planning depended largely on the structure and type of property, and the property located on it. New forest management structures established in this province, did not represent a form of co-operative management, but stressed the pressure of the Austrian government in the area. The Austrians co-ordinated the first forestry zoning, which played an important role for the local communities. An analysis of the network of human settlements in Bukowina throughout the period until the Greater Union, shows three types of settlements: *slobozii* (small villages belonging to a monastryor a squire), colonies and small towns.

2.3. The Inter-war and Post-war Stage (after 1918 – to date)

This is an inertial stage, strongly marked by the exploitation of natural resources and the building of the infrastructure inherited from the Austrian regime until 1945, followed by the communist period (collectivization and other state forms of organization in the plateau area). After Bukowina was integrated into Greater Romania, a series of activities that had become the brand of the region, continued to exist, with discontinuities, adaptations, or reorientation. The economic fluctuations recorded in the inter-war period reflected in some local changes, but remained the dominant mark stamped by the Austrian heritage and the relative conservation of the organizational structure in which private property was dominant (Chiriţă, 2005).

In Contemporary Times (after the last administrative organization of 1968), important changes and notable differences between the two distinct periods (before and after 1989) become obvious when analyzing the landscapes resulting from territorial planning, actually a new territorial zoning process, ie a new intentional and planned organization. We are witnessing an organized process generated by the interference of directions and flows of people and goods. After 1990, although a part of this organization began to fall as economic joint ventures appeared in the area, simultaneously with the crystallization of local cores, based on private initiative, the recovered resources fell under a new ownership regime (Muntele, Groza, Ţurcănaşu, 2002). The unique form, almost a matrix (Chiriţă, 2005) of private trade effervescence, followed much later by solid production initiatives, reflected in Bukowina area by the numerical increase of private companies or joint ventures over the last 10 years (2000–2010). Characteristic of the post-war period were two types of territorial planning: *public* – especially in the eastern plateau, and *private* – in the western mountain domain (Chiriţă, 2005).

Humanization was decisive for the historical scale of the spatial structure and it continues to shape macro-sketches of land use. The first characteristic introduced by human activity are the two units of urban planning, the built-up area and the unincorporated area; these are almost synonymous with the hearth and the estate.

Removing from the natural whole that part of the territory suitable to housing and urban planning is the first form of human interference with territorial planning. The flexibility of the limits of the built-up area was determinant for including in this category all suitable land a very poor in technical infrastructure, or without constructions on it.

The territorial community (villages, communes and municipias) having local decision-making power, is an element of diversity which, though diluted after communist uniformity and a common history, still belongs to individual religious confessions (Fig. 3).

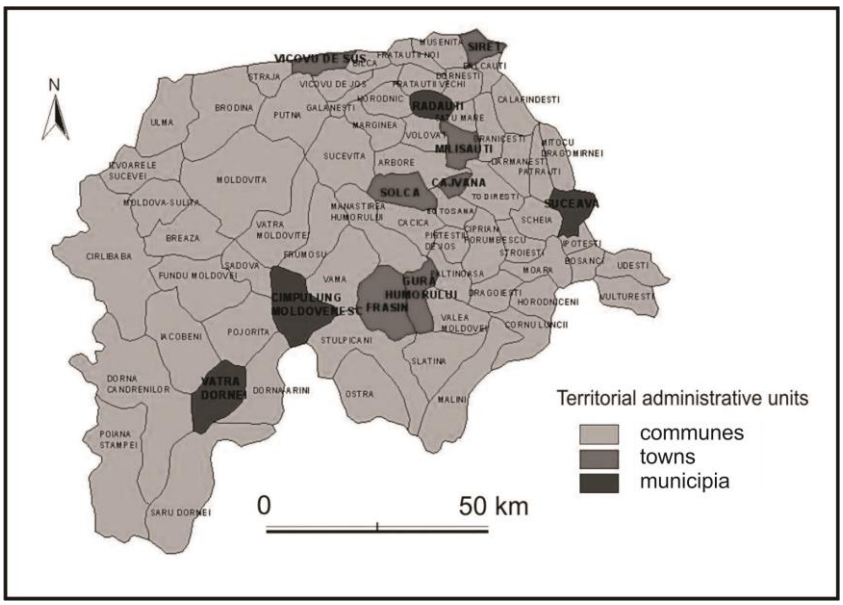

Fig. 3 – Territorial administrative units (DJSS–2006).

The major part of landed estates (especially in the mountains) is occupied by forests, pastures and meadows, agricultural land totalling less than 1/3 of the surface-areas; the main occupation is animal breeding, because arable land is limited and the conditions proved unfavourable for crop cultures, excepting potato, sugar beet and fodder beet, maize, rye and barley.

Having in view all the geographical elements contributing to territorial planning and the complexity of transformations underway, we estimate that the areas with the largest human concentration are in the eastern plateau, and in the north-east of Bukowina, along the two main axes: Suceava – Câmpulung – Vatra Dornei and Radăuţi – Suceava, along the valleys of Suceava, Moldova and Bistriţa.

CONCLUSIONS

Overall, the individuality of the South-Bukowina area is due both to its natural specificities characteristics and social-historical that, distingnish it from the rest of the Moldavian space, especially through spatial and functional homogeneity that stamped the residents' psyche (the feeling of belonging to that space – lived space, perceived space). Therefore, notwithstanding natural heterogeneity and, hence, habitat potential and conditions, the south-Bukowina area is a relatively homogeneous functional space, different from the rest of Moldavia, a mental space perceived *per se* by the local communities. From this point of view, Bukowina has all the attributes of a regional entity individualized bottom-up, through associative participation of the local communities, which ensures the functionality of the territorial whole. It is designated in the residents' psyche, the region becoming a mental space, a space of its residents' identity, the communion between man and his life environment, a fundamental element in the sustainability of any spatial structure. Mental spaces are both functional spaces and spaces of ethnic and cultural homogeneity; bottom-up structured spaces, based on the relationships between the local communities.

The fact that the region is the most complex geographical system is demonstrated by its great strength to outstand change, that is, not any intervention or set of interventions lead to a fundamental

change in the region, or in part of it. Its entire internal structural and functional organization helps maintaining the same order in the face of various types of external aggression. The various components and particularities of the spatial expanse make the region react to any environmental change through a series of changes in the opposite direction and equal in size to that which has given rise to it (Rosnay, 1975). The impact is gradually attenuated by the rapid communication capacity between the sub-systems, seeming that nothing practically happens in the entire geographical region. Due to the different transmission speeds of change, resistance to change is greater in the heterogeneous region than in the homogeneous ones (natural). The response of the heterogeneous regions components is quick, mitigating the effects of any intervention, with more response options and opportunities for adaptation. Chain diffusion processes of the mitigation effects delete the shock caused by intervention. Natural regions have fewer response options in mitigating intervention and only components in the adjacent area of impact do participate and not the entire region, as in the case of heterogeneous regions.

The operational entity in territorial planning, the territorial system, focused on a specific area, such as south-Bukowina, is composed of a plurality of sub-systems that rank in and integrate into the spatial enssembly according to its own laws, including both the historical-emotional and the natural ones. These sub-systems, regarded as sub-spaces of lower rank, are the result of the existence of geographical objects in a variety of moods and forms. The general characteristics and properties of these spaces are the same as the geographical space, but particular features are different, constituting the concrete reflection of interactions between components at territorial level.

The structure of the south-Bukowina area is rather complex, despite the relatively cultural and historical uniformity that left its mark on territorial planning, and a strong human community behaviour is stamped in the collective psyche. The organization prospect takes into account the resources of the studied space, the role of the physical and social infrastructure, the hierarchy proper to the settlement network (deeply confused by the new settlements raised to urban status in 2004) and the local, regional and national policies. The relationship between the local community and the regional community is a very complex one, and research into the south-Bukowina area shows how to optimize it.

All these elements lead to a linear-type concentration of habitation, the result being the emergence of relatively large settlements, deeply connected with their natural environmental resources.

The interaction with this natural environment was facilitated by the population's culture of respect for its surroundings, typical of the Bukowinian individual. This relationship of interdependence has generated a sound and lasting territorial relationship, where violence on the environment is by far more reduced than in the other national geographical areas.

So, harmony is still preserved and reflected in the physiognomy, functionality and structuring of the south-Bukowinian space.

The guide-lines of structuring the geographical space and its stability, facilitates (despite some (frequently contradictory policies), the process of detecting a specific organization model for the south of Bukowina.

REFERENCES

Barbu, N. (1976), *Obcinele Bucovinei*, Edit. Şt. şi Encicl., Bucureşti.

Bălan, T. (1960), *Din istoricul Cîmpulungului moldovenesc*, Edit. Glasul Bucovinei, Cernăuţi.

Chiriţă, V. (2005), *L'impact de la restructuration économique sur la dynamique du paysage en Bucovine*, Edit. Press Universitaire, Rouen, France.

Cocean, P. (1997), "*Ţara" (The Land) – A typical geographical region of Romania*, în Revue Roumaine de Géographie, **41**, Edit. Academiei Române, Bucureşti.

Cocean, P. (2002), *Geografie regională: evoluţie, concepte, metodologie*, Edit. Presa Universitară Clujeană.

Guran, Liliana, coord. (2004), *Rolul diversificării activităţilor economice în revitalizarea aşezărilor rurale din Bucovina,* Edit. Ars Docendi Bucuresti.

Ianoş, I., Heller, W. (2006), *Spaţiu, economie şi sisteme de aşezări*. Edit. Tehnică.
Ianoş, I. (1990), *Elemente metodologice privind analiza organizării spaţiului geografic*, S.C.G., **XXXIX**, Edit. Academiei, Bucureşti.
Ianoş, I. (1994), *On the "central place" functions of rural settlements in Romania*, Revue Roumaine de Géographie., **38**, Edit. Academiei Române, Bucureşti.
Ianoş, I., Popescu, Claudia (1997), *Organizarea spaţiului geografic la nivel de microscară*, Buletinul geografic, **1**, Edit. Academiei Române.
Iaţu, C. (1998), *Unele consideraţii asupra dispersiei, centralităţii şi concentrării aşezărilor în Depresiunea Rădăuţilor*, Lucrările Seminarului Geografic "Dimitrie Cantemir", **17**(*17–18*).
Ilieş, M. (1999), *„Ţările" – regiuni geografice specifice ale României,* Revista Română de Geografie Politică, **I**, *1*, Edit. Universităţii din Oradea, Oradea.
Iosep, I. (2009), *Braniştile – forme de utilizare a terenului în perioada medievală (studiu de caz – Branişte a Mănăstirii Voroneţ)*, Analele Univ. Ștefan cel Mare, Suceava, Secţiunea Geografie, Anul **XVIII**, Suceava.
Muntele, I., Groza, O., Ţurcănaşu, G. (2002), *Regionarea spaţiilor rurale din Moldova în perioada de tranziţie. Fundamentul geografic al strategiilor de dezvoltare*, vol. *Moldova. Populaţie, forţa de muncă şi aşezările umane în tranziţie*, Edit. Corson, Iaşi.
Oancea, D. (1979). *Despre ţară şi ţări*, Stud. cerc. geol. geof. geogr, **26**.
Rosnay, J. DE (1975), *Le macroscope, vers une vision globale. Seuil*, Paris.
Săgeată, R. (2004), *Modele de regionare politico-administrativă*, Edit. Top Form, Bucureşti.

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MONITORING SOME SMART CITY GEOGRAPHICAL CHARACTERISTICS OF MEDINA IN SAUDI ARABIA

HANY SAMY ABU EL ELA*

Key-words: smart city; Medina; GIS; quality of life.

Abstract. "Smart City" has grown as an important field of study, that relates especially to the future sustainable development of cities. There was a large number of attempts to formulate a more comprehensive and accurate concept to the smart city during the past years, focusing on the development of both place and people. Nevertheless, studies still lack in similar topics on Medina city. This paper aims mainly at exposing and analyzing some smart city geographical characteristics of Medina (a famous city in Saudi Arabia) with its important reputation of religious tourism in the Middle East and the Islamic world as a whole. It begins with the standpoint of reviewing some definitions of "Smart City" and its main axes to assess some of its geographical properties measurable or observable. Then, it demonstrates elements that ait as defects to the city development towards smartness. With the increasing role of the Geographical Information System (GIS), as an inelegant tool, helps in surveying, understanding, managing and monitoring complicated geospatial issues related to the smart cities' main aspects. The study applied ARC GIS 10.3 software, and depending on the data collected from official authorities and field-work led to the perception of some negative aspects that should be rehabilitated.

1. INTRODUCTION

The 21st century has brought a new trend of sustainable urban development, adding new dimensions to urbanization with a view to updating old cities by the integration of new strategies with new technologies and ways of life. Despite the prevalence of recent studies of smart cities, there is a lack of studies that treat Medina opportunities to be considered as a smart city.

This paper makes a review of the multiple definitions and characteristics of smart city found in the literature, then proposes a set of indicators that are essential for understanding the initiatives of Medina. Consequently, to evaluate what is the situation of Medina among smart cities by measuring components (governance, infrastructures and services, mobility, living and people) which are essential for the further elaboration of the smart city and are studied and evaluated in Medina from many perspectives. ARC GIS software is found to be a powerful tool in several study stages.

During the past few decades, Medina (an alternative name is Madinat Al-Nabi Mohammed) has become a city with half a million population in 1990, and recording 1,100,093 inhabitants in 2010; this was followed by urban growth and pressure on all its facilities and services. It has an important reputation in religious tourism, being visited by hundreds of thousands of people during some 10 months of the year (the Umrah season with the Ramadan and Hajj feasts) and even more. Visitors are concentrated in the central area around the Holy Mosque, where there are global hotels and residential homes. Accordingly, there are challenges of extra-pressure on facilities and services. So, the city is expected to offer better services in terms of infrastructure and facilities, to be more responsive to the citizens' and visitors' needs.

To make the city more efficient to accommodate the growing and evolving needs of its population, simultaneously preserving its resources and environment for future generations, it is

* Assistant professor, Department of Geography, Faculty of Arts, Fayoum University, Al Fayoum, Egypt, e-mail: hsa00@fayoum.edu.eg.

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necessary to follow developed methods in accordance to global technological advances. These methods are often affected by top-down factors (government policies and plans) and down-up factors (population characteristics and attitudes towards technologies). Thus, the idea of evaluating the geographical properties of Medina comes up to perceive its strengths and weaknesses to be a smart city. Furthermore, this paper checks the hypothesis of the importance of collaboration between citizens and government to develop Medina towards smartness.

The study depends mainly upon data collected from official authorities and field-work. GIS software applications (ARC GIS 10.3) are used in surveying, understanding, managing and monitoring the complicated geospatial issues of this study.

2. SMART CITY CONCEPT

As the smart city is a fast-growing field of research, its concept has been confused for several years' time. Some have mixed the fuzzy "Smart City"-term and certain terms which were simultaneous and consecutive (such as: Digital City; Wired City; Green City; Information City). Annalisa Cocchia attempts to compare different definitions of the city linked to the label "Smart City and to list them according to the literature review" (Cocchia, 2014). Furthermore, in previous years it was approached from different perspectives. In the same vein, Berardi reviewed some definitions proposed in this literature providing varied concepts regarding it (Berardi, 2015).

It can be safely said that "Smart City" focuses on the city now more than ever before. "It becomes wider to include aspects of applying the benefits of modern technologies for true development of the city elements in alignment with technical transformation" (Stratigea Anastasia, 2015). However, with the beginnings of the emergence of the term "Smart Cities", the focus was on the word "Smart", so some mentioned that a major difficulty in identifying the smart city definition is the confusion of meanings attributed to the word "Smart" and to the label "Smart City". Furthermore, the faith that the "Smart City" resembles the terms of "Digital City", "Wired City", "Knowledge City" and "Green City", which link technological informational transformations with economic, political and socio-cultural change (Hollands, 2008).

In-between the previous varied concepts, researchers attempted to draw up a comprehensive concept of Smart Cities, which can be summarized as follows:

– "The smart city is where the use of smart computing technologies makes the critical infrastructure components and services of a city more intelligent, interconnected, and efficient" (Washburn, 2010).

– "The smart city concept implies a community-driven reaction to solve traffic congestion, school overcrowding, air pollution, loss of open space and skyrocketing public facilities cost" (Pardo, 2011).

– "The smart cities, emerged as a solution of people's strong inclination to concentrate in cities, generated both positive and negative effects, such as traffic jam, carbon dioxide, greenhouse gases emissions and waste disposal with consequences on health conditions" (Caragliu, 2011).

– "The smart strategy is ICT, considered that the main issue is to meet the needs of the market, rather than the intelligence which is required for cities to be smart" (Dameri, 2013).

– "The smart city related to the concepts of smart community, sustainable city and green city, including the economic component, environmental component and social component" (Sylvie, 2013).

Finally, it must be said that the *smart city* is an extensive concept which describes cities with smart communication, urban governance, environment and people and produces smart living. Also, it can be said that the city could not be a smart one when there is shortage or surplus of its components (such as energy, water, services production or property).

3. SMART CITY AXES

According to the reiterative shared features of the city suggested to meet the future needs over the coming decades, there were studies drawing up the main axes of the smart city. Researchers of the future cities laboratory at the *Singapore-ETH Center* for Global Environmental Sustainability have explored the characteristics of the future city. They reached seven main pivots, considering the city as an urban metabolism. So they used the concepts of "Stocks and Flows" to describe its status and dynamics by studying material, energy, water, people's positions, finance, information, density and space on three different scale levels: "S (small)-scale": the individual building, "M (medium)-scale": the urban part and "L (large)-scale": the territory (ETH, 2015). This scales are similar to Hafedh's previous classification (Hafedh, 2012). After filtering, Pardo *et al.* (Pardo *op. cit*.) reduced these dimensions to three which have implied all dimensions as follows:

a) The "Technology dimension based on the use of infrastructures (especially information and communication technologies, ICT) to improve and transform life and work within a city in a relevant way. This dimension includes the concepts of Digital City, Virtual City, Information City, Wired City, Ubiquitous City and Intelligent City".

b) The "Human dimension based on people, education, learning and knowledge, because they are key-drivers for the smart city. This dimension includes the concepts of Learning City and Knowledge City".

c) The "Institutional dimension based on governance and policy, because the co-operation between stakeholders and institutional governments is very important to design and implement smart city initiatives". "Recently, main city smart axes come as smart governance, energy, environment, transportation, IT, communications and smart buildings" (Exhibitions, 2015).

4. GEOGRAPHICAL INFORMATION SYSTEM (GIS) AND SMART CITY

The Geographical Information System (GIS) environment is considered as an adequate spatial data platform for a lot of the smart city pivots such as mobility, energy, communication, population and others (Joseph, 2014).

The importance of applying *GIS* in smart cities comes basically from identifying location-based services. It facilitates geographical data storing, updating, analysis and visualization that help decision-makers without wasting time. Furthermore, "it introduces powerful tools that allow both city mangers and citizens to create interactive spatial queries, analyze, get maps , reports and results" (ISO.ORG, 2014).

Some researchers have addressed the interaction between *GIS* capabilities, cloud computing, geo-visualization, and human-computer under the term of "Interdisciplinary Urban *GIS* science" in order to transform the cities' managements to a more efficient level, "especially in the fields of transportation, risk management, urban planning, noise mapping and solar energy" (Li, 2013). Besides, accurate updated data are very important elements to manage smart cities, by increasing the importance of real-time measurement and data transfer techniques. The raw data no longer worth the same value as they previously had, requires a lot of data analysis to take rapid decisions to help manage the crisis. These decisions always have spatial dimensions, such as problems of traffic and transportation, water, sanitation, etc., maximizing the value of *GIS* in all of the smart city components.

Modelling and simulation are the most important *GIS* applications concerned with the smart city geo-spatial management, they act as a platform which can serve many topics, such as;

- Monitoring urban growth and Change detection.
- Managing networks (water, electricity, and sanitation lines).
- Planning roads, locations, and services (selecting the smart locations).
- Interpolation of digital surface models (DSM).
- Setting up GIS with 3D capabilities (3D city model from satellite images).
- Handling the dynamic and semantic aspects of city modelling and simulation.

- Producing intelligent maps and implementing them online through WebGIS.
- GIS excessive capability in representing visible and invisible phenomena of the city
- Crime prevention (using data-collected through GPS and intelligent map).

Finally, it can be said that applying GIS technology to smart cities emerged as a complete package referring to a number of modern technologies and advanced processes of expanding knowledge of urbanization and connections among people to manage and deliver spatial data by geographical location. It illustrates the problem of location, its surrounding context, different scenarios in a dynamic environment and suggested solutions.

5. STUDY-AREA SMART SITE AND LOCATION

Medina is the capital city of Al Medina Province which is located in the Western part of Saudi Arabia (Fig. 1) at the intersection of 39° 36' E long. with 24° 28' N lat. The city is situated on the Arabian shield composed of metamorphic rocks dating to the first geological period of the Paleozoic Era. It seems to be in harmony with nature, and is surrounded by mountains from all destinations that can be seen particularly from the North and the South. The mounts of "Ohod" and "Thor" are seen in the North, "Eyr" in the South and "Dalee Al Bary" in the West.

It has a distinctively hot desert climate. Summer is very hot, but Winter is milder, with very little rainfall sometimes. It rains almost entirely between November and May.

The city gained its importance as the second most important Islamic city in Saudi Arabia after Mecca, which is visited by thousands of Islamic visitors. Also its nodal site at the intersection of a number of highways that connect it to some important cities in Saudi Arabia supported its smart site. It connects to: Riyadh, Yanbu, haiel, Jeddah, Mecca and Tabuk (Fig. 2). Its location had the same importance in the past because it lay on the old caravan route which linked the South of The Arabian Peninsula with the Levant (Sham) in the North.

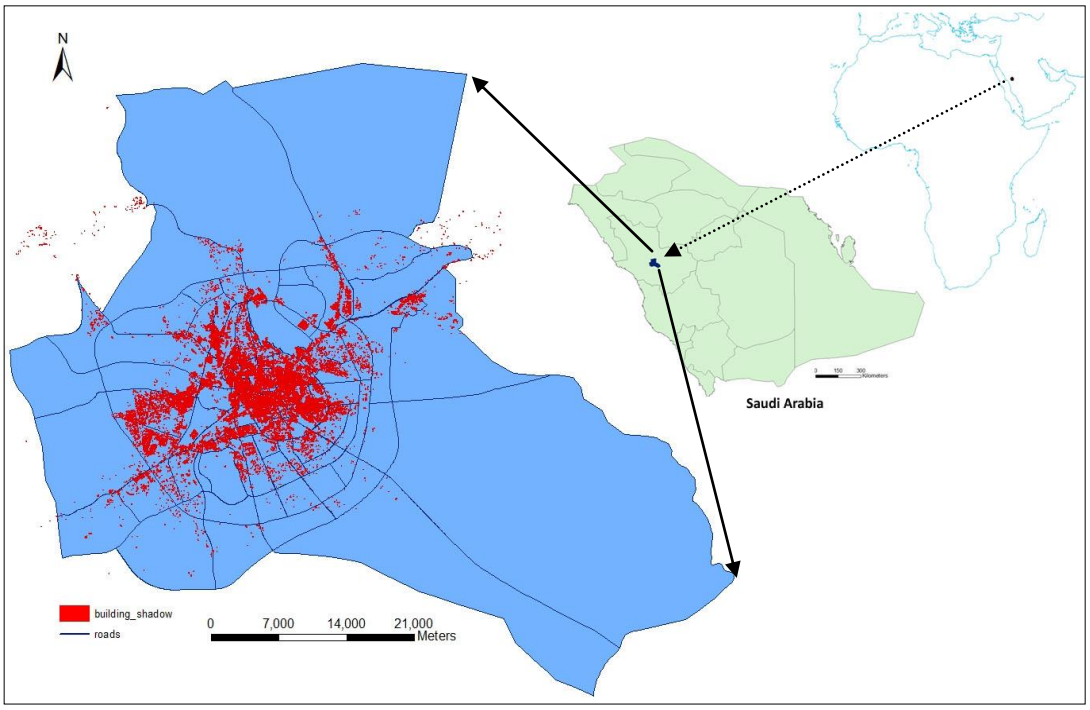

Fig. 1 – Medina (Al madinah Almunawwarah). Location.

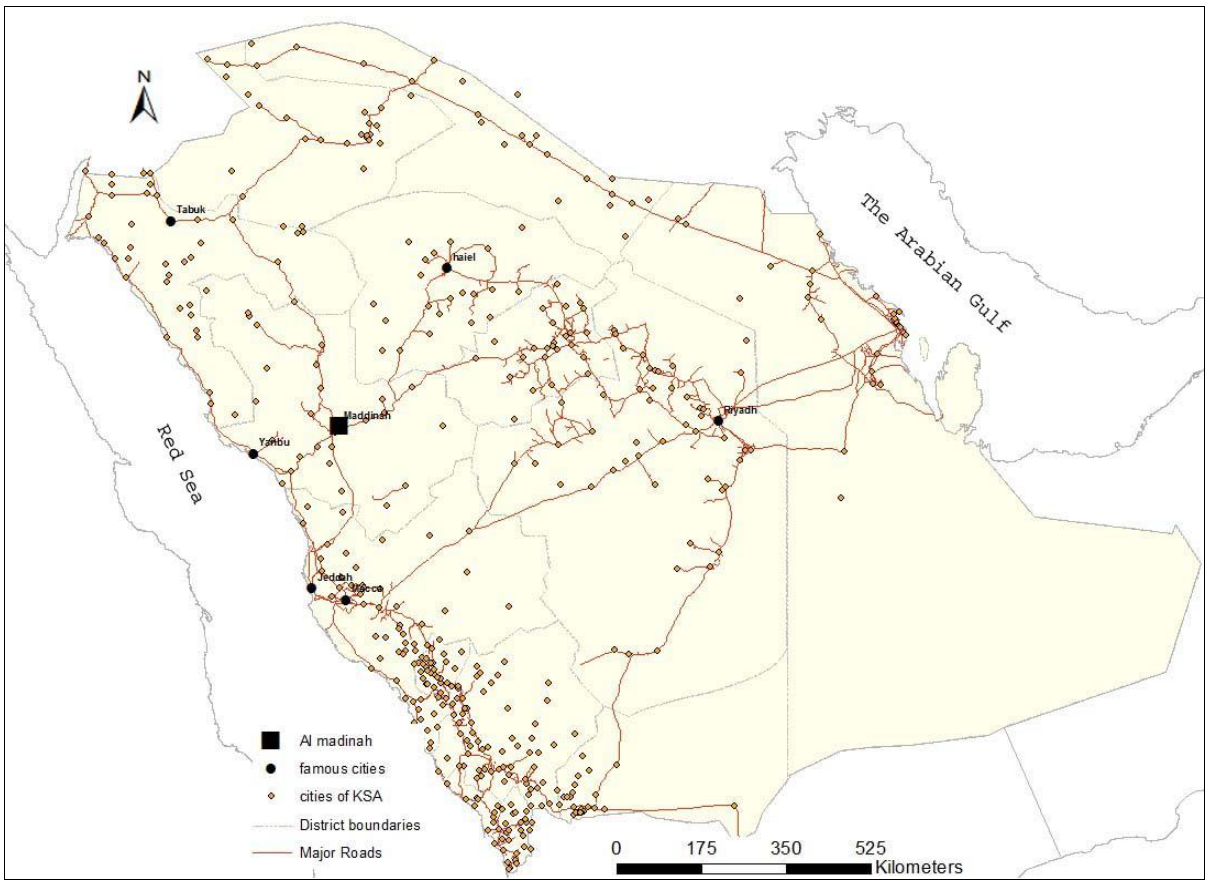

Fig. 2 – The nodal site of Medina Location
at the intersection of highways.

6. MEDINA SMART CITY DOMAINS

Although nowadays a smart city is a critical issue in the literature, yet there are few design methods and architectures of smart cities. The event-driven approach to the smart city design is unclear, too. On the other hand, there are many recently published studies that deal with smart cities and their architectures which may help drawing up the main elements for Medina to be a smart city.

With respect to such studies previously discussed, the smart city components are governance, information, mobility, economy, environment, services and people. The current study-framework includes five characteristics (Fig. 3) as a targeting the further elaboration of the smart city which examined and evaluated Medina from many such perspectives.

It should be noted that each of the following characteristics is therefore defined by a number of factors. Then, each factor is described by a number of indicators which are derived from public and freely available data. The study always takes into account the overall target. These five characteristics are as follows;

– smart governance.
– smart mobility.
– smart people.
– smart infrastructures and services.
– smart living (Quality of life).

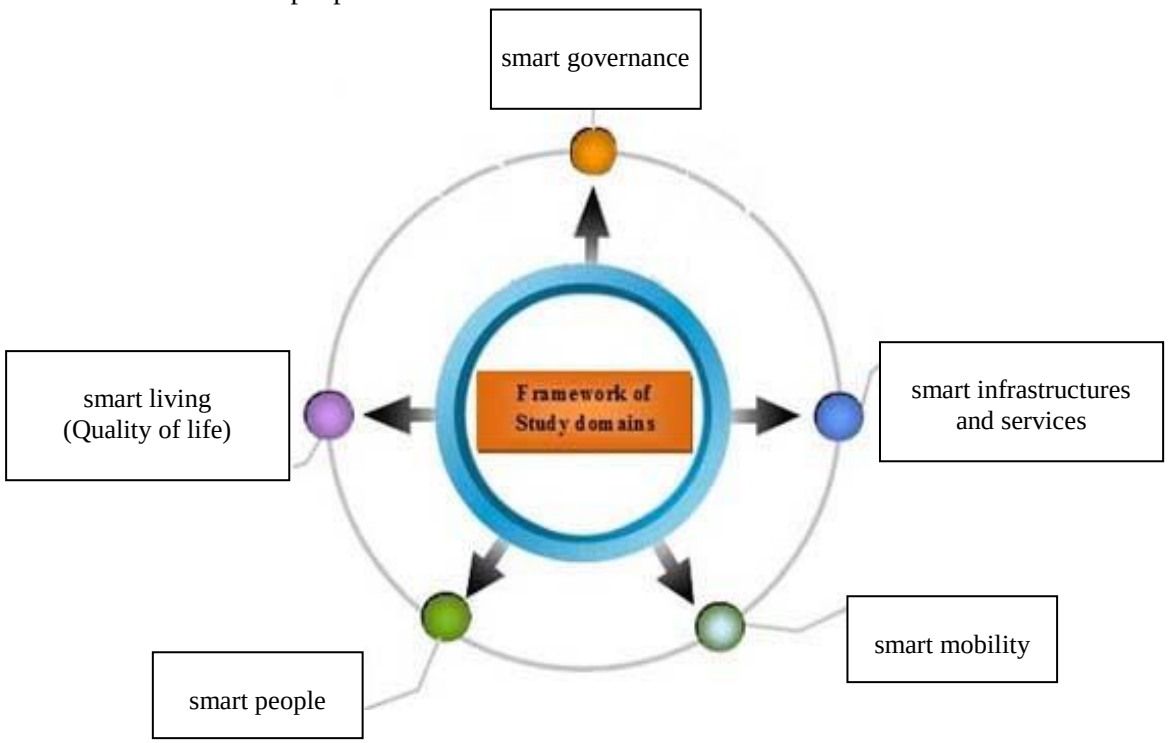

Fig. 3 – Framework of study domains.

6.1. Smart Governance

Governance is the exercise of the political, economic and administrative authority to manage a nation's affairs. It is a complex of mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights and obligations, and mediate their differences (Somayya Madakam, 2014). Medina *leadership and governance* comes basically from its regional municipality. On the other hand, the "Al Madinah Al Munawarah Development Authority" participates, together with the municipality, in planning fields.

Since *smart governance* depends on the implementation of a smart governance infrastructure that should be "accountable, responsive and transparent" (Mooij, 2003), a field survey with a preset questionnaire form was conducted for monitoring and evaluating the smart governance maturity level of Medina city. The questionnaire included inquiries about the main objectives of smart governance which achieve greater efficiency (e.g. strategies, visions and plans) in addition to the technological tools and facilities that support decision-making.

Depending on the selected measurement factors shown in Table 1, the top-down smart city strategy is simply absent, no leadership engagement related to it and the vision towards smart is exhibited on a case-by-case basis in a decentralized way. Most departments have documented clear roles, but no dedicated teams for the smart city were formed.

City governance basically applies technology (fax, tel. and internet) to facilitate and support better planning and decision-making. It introduces electronic services in several sectors (to be addressed in detail later), but continuous improvement of services through innovation is absent in all

the departments. It is worth mentioning that *GIS* is used merely as a portfolio of spatial data, as well as some on screen analysis. On the other hand, failure to activate "Cloud Computing" technology reduces the benefits of this GIS technique.

Although, the smart governance concept must comprise performance measurement tools, in which feedback registration is an important factor, yet it is ignored in the city.

Table 1

List of the main objectives evaluated according to the field survey used to assess the smart governance maturity level of Medina city.

Objective		**Regional Municipality (Departments) :**	Follow-up and control	Reconstruction and projects	Coordination of project implementation	Municipal Affairs	Services	Administrative and Financial Affairs	information technology	Municipal investments	Info. Media	Regional development, Planning & Quality	Legal Affairs	Human resources	Land and the landowner	Public relations	**Development Authority (Departments) :**	Urban development	Information Technology & GIS	Planning	Administrative & Financial Affairs	Legal Affairs	Transaction systems	E-competitions	Tender announcement
1 – Strategy			×	×	×		×	×	×	×		×			×			×	×	×			×		
2 – Vision						×	×	×	×		×	×						×	×	×			×		
3 – Clear role			×	×	×	×	×	×		×			×		×			×			×	×	×	×	×
4 – Dedicated Team work			×				×		×									×	×	×					
5 – Partnership																								×	×
6 – Innovated civil services																									
7 – Applying Technologies	Tel.		×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Fax							×	×		×			×		×		×	×				×		×
	Internet		×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Cloud computing																								
8 – Applying GIS							×												×						
9 – Electronic Services	business sector						×														×		×	×	×
	governmental sector						×														×		×	×	×
	individual sector						×																×		
10 – Feedback regist. & Performance Measurement																									

6.2. Smart infrastructures and services

Although, the effective networks of infrastructures and services are important for sustainable cities, the smart city idea depends mainly upon applying articulated soft infrastructures, i.e. mobile applications, social networks and the communities' cultural systems, and various forms of *ICT* which improve the performance of such hard infrastructures and services.

6.2.1. Electronic (E)- Government

E-Government is the term coined to describe this soft real time infrastructures and services. It depends on providing access of needy citizens to government information and services (regardless of their cultural and technical level of access to information and communication technologies). Services are provided through some government centers, private centers and smart phones. *E-Government* includes many services supplied by various ministries and other government agencies for citizens, thus shortening time and distance since geographical factors play an important role in service assessment. Decree No. 7/b/16,838, issued in 2001, established the national plan that regulates the stages towards e-applications in Saudi Arabia in general, and in Al Medina (mcit., 2015). The city has moved to implement *E-Government* in most government departments. The government services percentage converted electronically increased from 29.4% in 2009 to 31.6% in 2013 (Observatory, 2013).

Accordingly, some *E-Government* services centers have been distributed in several parts of the city, supplied with computers connected to the internet to provide and conduct electronic transactions. These services were applied first at post-offices, then at private centers in response to the increasing needs of users for electronic transactions. After that, the opportunity of logging in this applications became available on smart mobiles. Figure 4 demonstrates that there are 80 *E-Government* services centers in Medina, their distribution pattern being seemingly clustered within the second round road, but they are also dispersed in the other parts of the city, too.

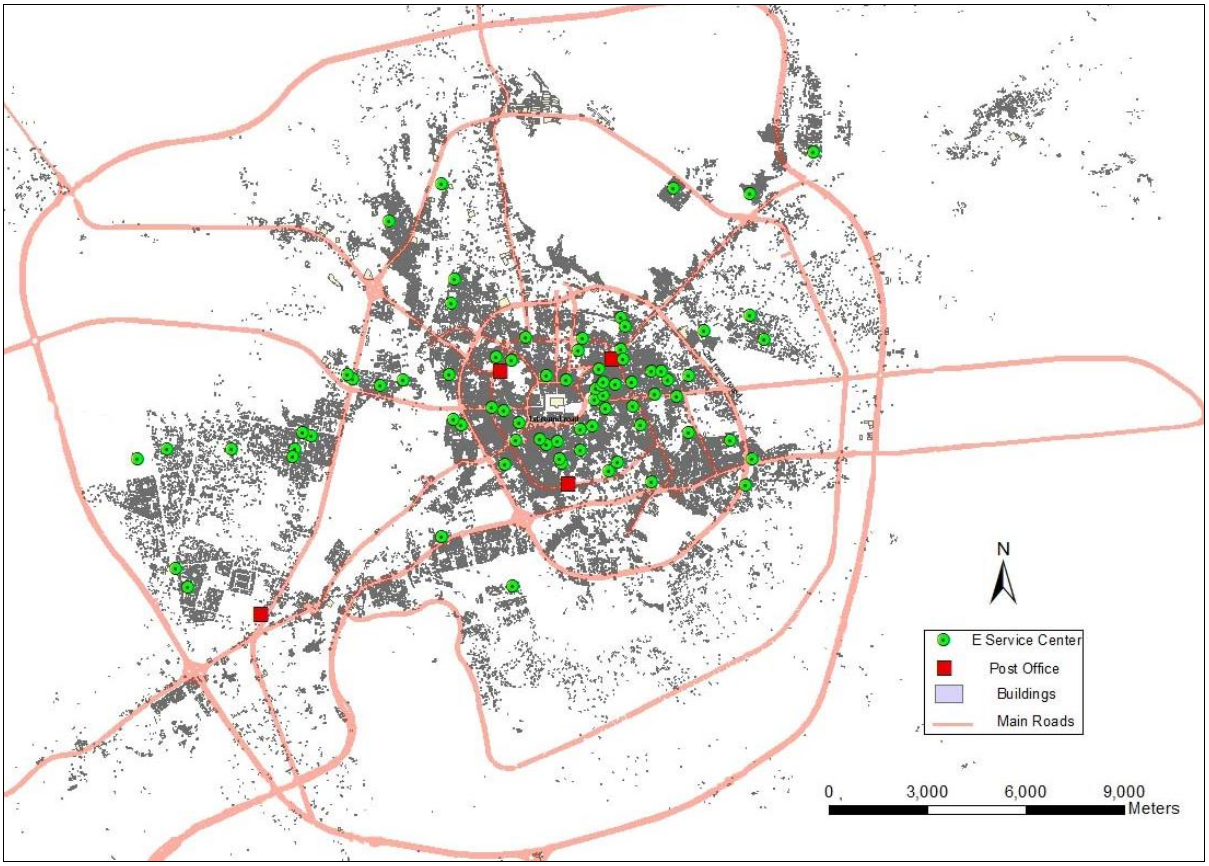

Fig. 4 – E. Government Services distribution pattern in Medina.

(ARC GIS 10.3 is applied to calculate the nearest neighbour index using the equation: Nearest neighbour index (R) = observed distance / expected distance)

6.2.2. Accessibility of services data (Open Data)

The data quality and *open data* platform strategy meet the demand for citizens who would like to access their services easily at home, or at work via the web, or on their mobile devices. This confirms the deep-going concept of smart cities that allows data sharing and transparency.

Data openness does not mean only the opening up of data by government authorities, but also making data available for privately-owned companies and individual citizens to use and share them.

In such a context, a questionnaire (of 300 form) was applied to some firms, authorities and individuals aiming at measuring the availability of several sectors to obtain the data. Figure 5 shows the results of applying this questionnaire, indicating the availability of the open-data platform as follows:

a) It is clear that the public authorities have distinctive access to open-data movement compared to private companies and individuals.

b) Education, administration and finance data represent major open domains for all the sectors.

c) Individuals offer open data in certain areas (e.g. Education, Health & Public Safety).

d) Sport, transportation and environment represent minor open domains for all.

It is important to note that data sharing will raise concerns about information security, privacy and data protection. So, controls may be necessary to identify what type of data can be processed (as open) and in which sector.

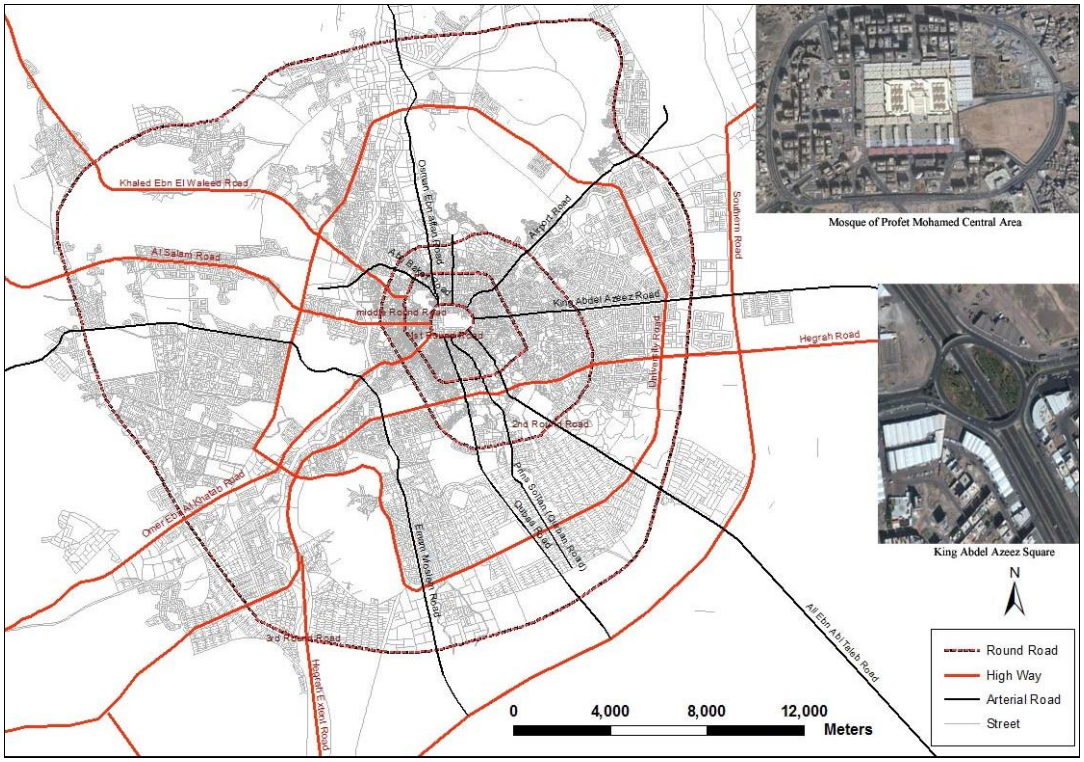

Fig. 5 – Open-data availability by categories in Medina.

6.3. Smart Mobility

Medina is growing, and so is the number of trips taken within the city. In the *mobility* concept, attention is paid to ensure sufficiency, as well as efficiency. Smart mobility generally aims at local accessibility, (inter-) national accessibility, sustainable, innovative and safe-transport systems that can

be described by traffic management, reduction of time and energy and facilitate travel and payment of tolls, all aiming at the citizen's satisfaction.

Somayya determined the smart mobility framework emphasizing travel choices, healthy, lovable communities, reliable travel times for people and freight and safety for all users (Somayya *op. cit.*).

To analyze the mobility performance of the city, the following factors will be included;

- Road classification.
- Transportation means.
- Use of non-motorized traffic.

6.3.1. Road classification

Medina has a good network of roads and streets, both within the city limits and beyond them. It can be said that the important location of the Mosque of Prophet Mohammad has clearly reflected in these radial network of roads that ends up in Medina. Figure 6 illustrates a detailed profile of the three road classes in Medina, based on their type, condition, width and designated speed, as follows:

The first type (Round Roads) consists of four closed ways of circular rings that surround the Mosque of Prophet Mohammad. They are between 60 m and 100 m wide. The designated speed on these round roads is 110 kilometers per hour, except for the first round road where speed is of 80 kilometers per hour. These round roads represent the main framework of traffic adjustment and most of the movement within the city, especially of the large number of vehicles around the Mosque.

The second group includes those highways that function is fast-going traffic to and from the city centre towards the peripheries and beyond them. They are about 100 m wide, speed allowed at 120 kilometers per hour.

The third group consists of arterial roads, no more than 65 m wide, which help the functions of highways speed: only 60:80 km/hour. In-between, there is a good network of paved streets that connect the above-mentioned types of roads.

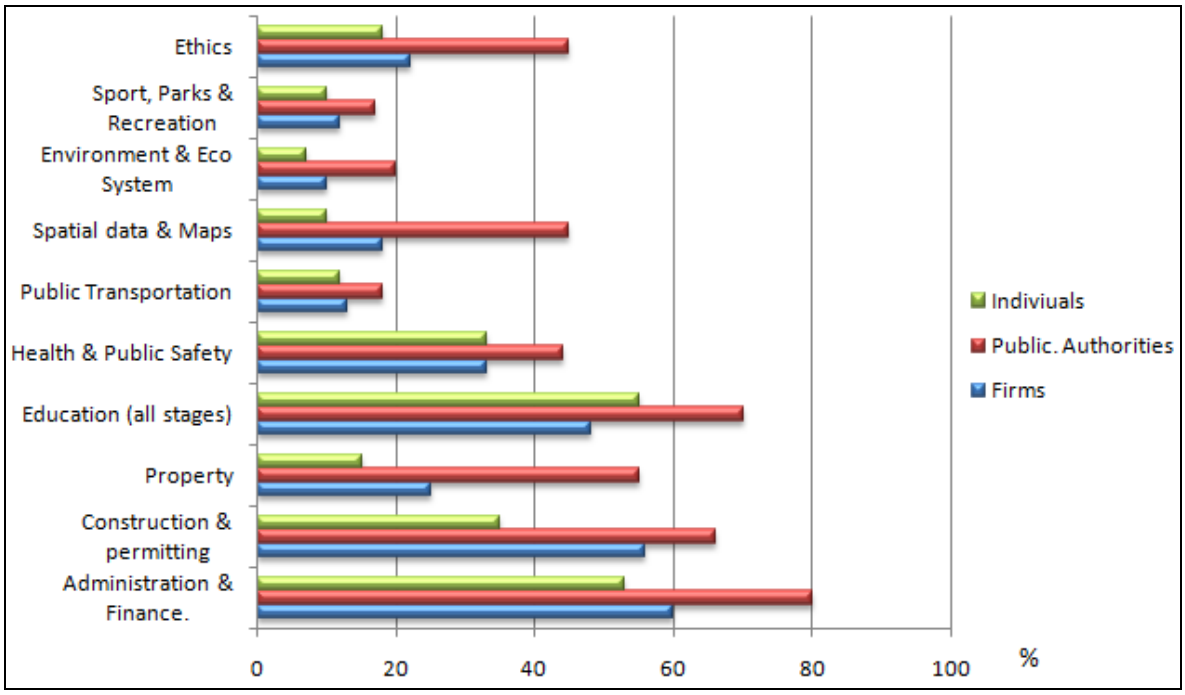

Fig. 6 – Medina network of roads and streets.

6.3.2. Transportation means

Transportation means in Medina are of two kinds: for goods and for passengers; transport is private and public.

According to the reports of Medina traffic department (Department of Licensing), in 2014 there were 49,350 cars in Medina area (data on the city numbers are unavailable) that is by 8,630 more to than in 1994 (40,720 cars). Private cars represent 48.4% while other types vehicles account for 51.6% of the total number of licensed cars. It should be noted that private cars are used for the transport of passengers within the city, either by their owners, or by taxi services, where the law allows it.

Public transport is the second type of movement in Medina, the Saudi Public Transport Company *SAPTCO* operates a comprehensive network of high-quality bus services across the Kingdom of Saudi Arabia. They link all major cities, towns and villages.

There are ten bus lines departing from Medina to the surrounding cities (Jeddah – Al Mahd – Mecca – Yanbu – Tabuk by desert road – Tabuk by coastal road – Riyadh – Dammam – ELola – haiel), covering the passengers' needs. The main lines, operated by the company for the Medina area, run between Medina, Mecca and Jeddah. In 2014, there were 4,016 trips from Medina to Makkah and 4,989 in the opposite direction, transporting nearly 131,000 passengers (SAPTCO, 2014). On the other hand, the Medina–Jeddah line registered 4,658 trips from Medina to Jeddah, and 4,124 trips in the opposite direction. Data on trips, ticket reservation and payment methods can be easily obtained on the internet.

As for international transport, the city depends on two ports in the adjacent Yanbu city, namely King Fahd industrial port and the commercial port, besides the two airports: Prince Mohammed bin Abdul Azeez Airport within the city and Yanbu Airport. As the region has an old railway-line (the *Hijaz* line), which is out of service now, there is an ongoing project to build a new railway-line between Medina and Mecca.

There is no doubt that modern transport technologies, logistics and new transport systems improve the inhabitants' mobility. So, traffic management is an essential element of the cities towards development and smartness. In this context, the Medina Government has planned traffic management inside the city and beyond it as follows:

As regards traffic management on roads outside the city, the K.S.A. Ministry of Transport has been measuring the traffic volume on the regional roads since the beginning of 1992; this is done by a number of permanent stations including one in Madinah (Station No. 104) located on the Medina/ hanakiyah road. They count traffic per hour on the track direction by vehicle type, an annual report presenting data for each station. On the other hand, the Hajj Research Center makes permanent reports on the traffic volume at the four main entrances to Medina. The processed data have been converted on tables. The other component that supports traffic management on roads from-and-into the city is the Police unit for road security that oversees roads traffic and has accurate statistical data on road accidents in terms of location and degree of injury.

Within the city, there is an automatic Traffic System of connected control centers, in terms of Traffic Laws, street marking and cameras. The city's traffic plan includes the following objectives (Ministry of Transport, unpublished report):

- Reducing traffic congestion especially in the central area.
- Securing compliance to traffic laws and rules.
- Optimizing traffic flows within the city.
- Reducing accidents in the city.

Noteworthy, Medina has witnessed a phenomenal growth of vehicles. As a result, many of the arterial roads and intersections capacity is exceeded and average journey speeds on some roads at peak hours are low. Also, the time required by citizens for everyday mobility and the number of trips taken are subject only to minimal variations.

6.3.3. Use of non-motorized traffic

It can be said that if the traffic situation in the city depends mainly on individual motor vehicles, the higher population growth rate will result in more car trips, energy consumption, emissions of pollutants and the intensive use of urban space in the city. This will affect a high quality of life for its dwellers.

Although measuring non-motorized movement on sidewalks, bikes, etc. is difficult because official data and tools are missing, yet researchers did use two distinct methods to monitor this type of traffic: "(1) short (1– or 2–hour) manual counts, and (2) continuous measurements using automated instruments" (Papanikolopoulos, 2010). Others have used aerial photography for the same purpose (Behnam, 1977).

In Medina, there are no bicycle facilities or pedestrian lanes such as painted bike lanes, except for only one off-street for pedestrians and cyclists, including sidewalks and trails. So, applying GIS is effective to classify streets and determine every street's general function according to various land uses. Classifications include main roads (round roads and highways), arterial roads and local streets. A student-team conducted the field count. They measured traffic volumes for pedestrians and cyclists at 30 locations (selected for their characteristics of special interest) and calculated the hourly traffic volumes (Fig. 7). Most counts have been made in October and November at two peak-hours. The general trends in volumes at the selected locations proved traffic variations (pedestrians and cyclists) in relation to location characteristics and land use. The observation showed the increase of pedestrians in the central area and commercial streets compared to other parts of the city, while the number of cyclists in the city was the lowest.

It should be noted that these results cannot be broadly generalized to the city because the location and timing of these observations were not random. So, they are nothing more than just indicators for the study.

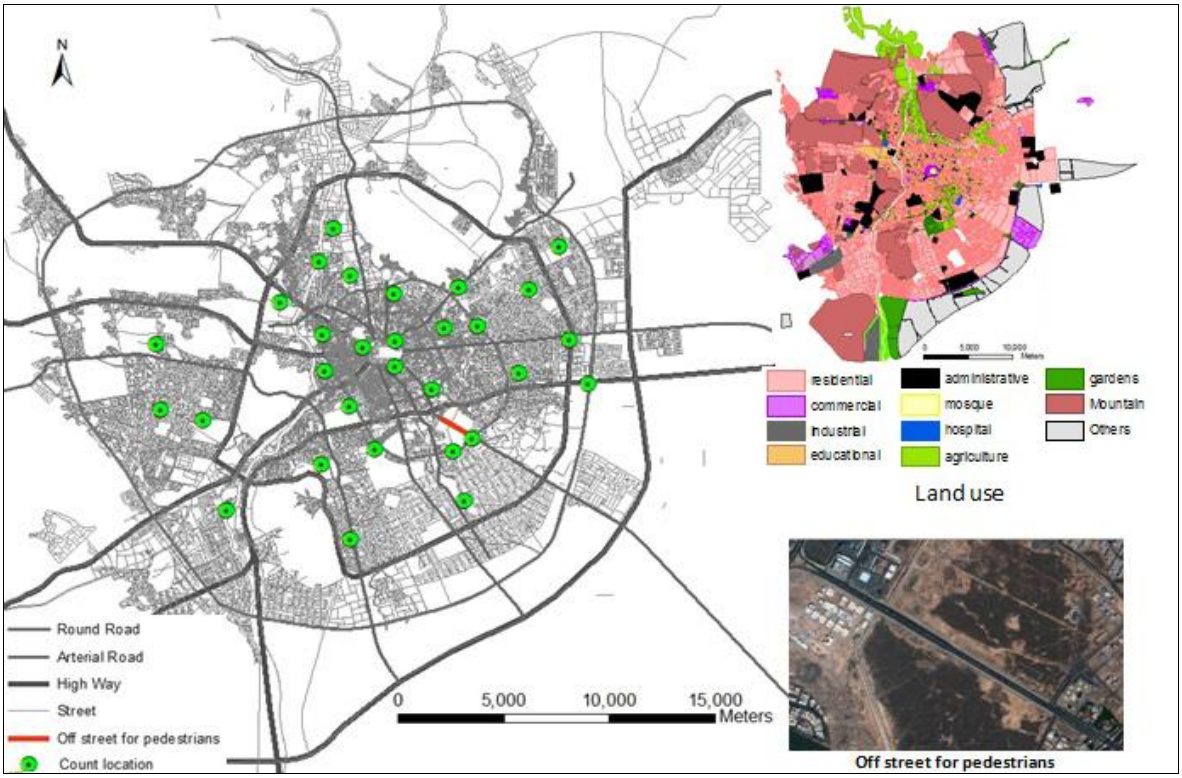

Fig. 7 – Locations of non-motorized traffic counts and land use.

6.4. Smart Living (Quality of Life)

Due to the final report of a research project on Smart cities Ranking of European medium-sized cities (Ljubljana, 2007), "smart living comprises various aspects of the quality of life. The most important of these aspects is housing, health, education, environment and tourism". They will be studied in Medina in the following.

6.4.1. Smart housing

According to the socio-economic survey of the *Urban Observatory Center of Medina*, average per capita housing 2012 was 34.9 square meters in Medina (Observatory, 2012), while the rate of overcrowding reached 1.6 individual / room. These rates are acceptable according to international standards. Moreover, dwellings that meet health requirements in construction (with building permits) represented 85.4% of the total number of dwellings in the city (2012), while 14.6% of them had no building permit, being located in the slums.

Besides, the city has 8,113 vacant housing units, which represent 3.7% of the total number of housing units in the city (non-allocated for the accommodation of pilgrims) (Electricity, 2014). Most of these high-value units are beyond the purchasing power of a large number of people.

6.4.2. Smart health

Smart health can be described by the rate of hospital *beds per inhabitants*, *doctors per inhabitants* and the quality of service. There are a number of public and private hospitals in Medina, with an average of *21.6 beds per 10,000* inhabitants (Health, 2014). This is a good rate compared with the rate of beds in Saudi Arabia in general (*20.1 beds per 10,000 inhabitants* in 2014).

In 2014, Medina had *18.1 doctors per 10,000 inhabitants*, whereas Saudi Arabia had *19.8 doctors per 10,000 inhabitants*. Therefore, that same year, the mortality rate was *10.6 per 100,000* live births, and it was *12 per 100,000* live births in Saudi Arabia.

6.4.3. Smart basic education

The smart basic education indicator could be derived from some elements, such as number of *students per inhabitants*, *educational quality* and *satisfaction with access to the educational system*.

In brief, it can be stated that there is a wide variety of male and female education enrolment rates in Medina. In 2013, male enrolment rate in primary, preparatory (Intermediate) and secondary schools was 77%, 79%, 76% (Educational, 2013), while the female enrolment rate was 71.4%, 71.3%, 72%. Figure 8 A illustrates the absence of female rates in comparison with males, because of conventions that underestimate female education.

On the other hand, the quality of education can be evaluated by classroom density. It is from *28.0 to 29.5 pupils per class* in primary and preparatory schools, and between *36 and 38.9 students per class* in secondary schools. These numbers are better than those in Saudi Arabia generally, but in regard of the structural condition of schools, reports indicate that only 23.4% of them meet quality requirements and this is a big drawback for school buildings in the city.

The number of students to teachers represents a good indicator to measure the quality of education. Reports in 2013 show 17.6, 14.9 and *16.3 students per teacher* in primary, preparatory and secondary schools in Medina, compared to Saudi Arabia (*11.6, 11.2 and 11.9 students per teacher*) (Fig. 8 B). That means that Medina is in need of additional teachers for all stages of education.

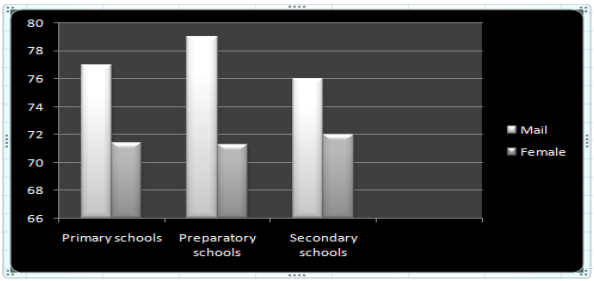

Fig. 8 A – Male and female education enrolment rates in Medina.

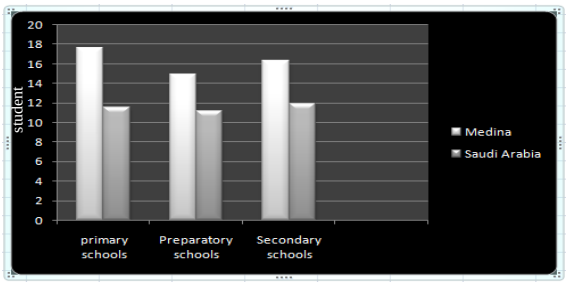

Fig. 8 B – Number of students to teachers in Medina and KSA

6.4.4. Smart Environment and Tourism

The Medina environment can be evaluated by reviewing pollution rates and waste management. Due to the importance of air quality as one of the most significant indicators of the environment, the *Pollution Measurement Laboratory* in Medina municipality reported five types of air pollutants in 2013: Carbon monoxide, Carbon dioxide, Nitrogen monoxide, Nitrogen dioxide and Sulfur dioxide (Municipality, 2014). Although rates were within the allowable range compared to the international standards of air pollution, yet some pollutants, such as Ozone, were not measured.

It should be noted that hydrocarbon compounds, considered to be one of the most dangerous substances for human health, whether they come from the vehicles tailpipe (diesel) or from petrol, have a high density in Medina. Furthermore, a great risk for "Smog" to appear if these hydrocarbons are combined with dust, and smoke, especially in the central area of the city with its tall buildings and high density traffic. Studies (Zollaly, 1998) show the effect of pollutants as a cause of pulmonary edema and other diseases.

Water quality and its efficient use are also important indicators of environment quality. Medina water supply is based mainly on a network of underground pipes (in 84.1% of the buildings) (Water, 2014) which carry water into the tanks under each building, the water being pumped to tanks above the buildings by electric pumps. Danger often lies in this system, because of contaminated reservoirs, both underground or above the buildings, especially when they are not disinfected periodically. Portable tanks on trucks represent the second way of water supply in Medina. They carry clean water for off-grid buildings, and sometimes to buildings connected to the network during outages time.

With regard to water consumption, the amount of water in Medina was of 38,341 thousand liters per day in 2014, with an estimated 307 liters per capita and more in the Hajj and Umrah periods.

On the other hand, the buildings connected to the sewerage network represented up to 56.3% in all (2014) (Observatory, 2014), the majority depending on the underground reservoirs for sanitation: evacuation and transportation to the treatment station may lead to sanitation water leaking into the soil and groundwater.

Waste management is an important component of the environment management system, too. Reports indicate that the amount of solid wastes was 385.3 thousand tons in 2014 (with an increase of 18.2 tons compared to 2006) and an estimated 0.39 tons per capita, which is an accepted rate.

Despite the existence of containers for waste collection in every neighbourhood, permanently emptied periodically and the damaged ones replaced, a lot of these containers are usually filled during the day; so wastes can be seen around them, possibly because waste collection trucks come only twice a day.

Smart tourism can be described by tourist attractivity and tourist housing. Medina has an internationally important rich cultural heritage, with Islamic sites like the Prophet's Mosque and some other mosques of historical interest. Numerous archeological and other important historical sites lie in

the surrounding areas, such as "Saleh cities" in El Ola. There are also many regional monuments, historic cities, urban neighbourhoods, old trade routes and some museums of heritage value. Beaches, unique marine resources appropriate for recreation and natural sites, exist in Medina. Besides, Medina has some central gardens and parks throughout the city and many neighbourhoods of small and medium-sized gardens. According to the reports of the Urban Observatory, in 2014 there were about 5.1 square meters per capita of public gardens and parks in Medina, but studies (Makki, 2011) reported their decrease from 50 in 1988 to 44 in 1994 due to the lack of irrigation water and the change of ownership from public to private.

Applying *ARC GIS 10.3* (Buffer-zone analysis) indicated that 91% of the buildings on the first ring road were located in a 1,000 m buffer-zone gardens, and 67% in a 500 m one; 78% of the buildings on the second ring road lay in a 1,000 m buffer-zone and 55% in a 500 m one; 46% of the buildings on the third ring road were sited in a 1,000 m buffer-zone and 23% in a 500 m zone (Fig. 9).

Tourist housing in Medina falls in three categories: 1-hotels; 2-apartments; 3-guest-houses. There are 66 hotels and 131 other types of tourist housing (S.M.C, 2015). Applying *ARC GIS Mean Center point* application on the distribution of hotels and other types of tourist housing in Medina proves that the *mean center point* of hotels is located in the North-West corner of The Prophet's Mosque, while the *mean center point* of the other types of tourist housing lies in the South-East corner (Fig. 10).

Fig. 9 – Garden buffer zones in Medina.

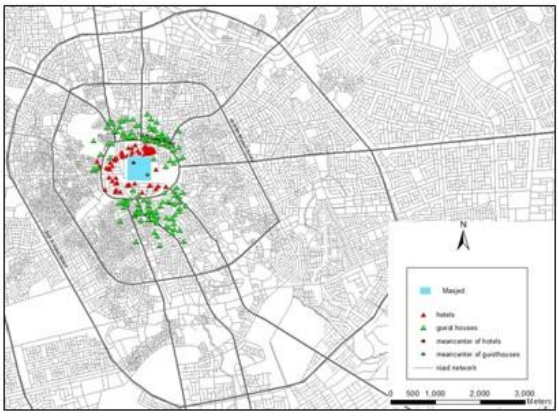

Fig. 10 – Mean Center point of Medina hotels and other types of tourist housing.

6.5. Smart People

People are considered the main factor of urban studies. As there are a variety of definitions to describe smart cities, the conceptual variants that can define who the smart people are varied and mutually connected. In general, *smart people* are described not only by the level of qualification, but also by the elements referring to innovation, social interactions, both public life and openness to the "outer" world.

Studies conceptualize smart people by laying explicit emphasis on learning, training, creativity and knowledge (Coe, 2001), (Campbell, 2009) and (Kanter, 2009). Thus, Smart people can be characterized by the following:

- Higher education and training.
- E-Learning.
- Creativity and knowledge.

6.5.1. Higher education and training

A basic element in the development of cities is having well-educated and trained people. There are two universities in Medina. In 2012, the rate of enrolment in higher education was 34.1% of the city's total population aged 18 and over (Observatory, 2012), compared to 39% in Saudi Arabia. While in 2006 it recorded 33.6% in Medina, it reached up to 38.9% in the entire Kingdom (Fig. 11). This percentage rise in the city may be due to the activation of new educational systems suiting a large class of students who do not attend the university through distance learning and affiliation.

A random sample of the city population (4% of Medina's total population) proved that there are variations in peoples' training percentages in terms of their jobs. There are 97% and 49% of the specialists and government employees, respectively who attended training courses, only 9% of students and 6% of other job people. Analyzing the information considered, it follows that the major percentage of government employees, students, and special job people (like professors, doctors, engineers, etc.) were obliged to attend training courses to meet the requirements of their jobs. The study also showed that the majority of the trained population followed local training courses in Medina. Although 41% of the study sample considered that the educational and training offers were suited to the needs of today's market, 59% felt that they were not (Figs. 12 a,b,c,d).

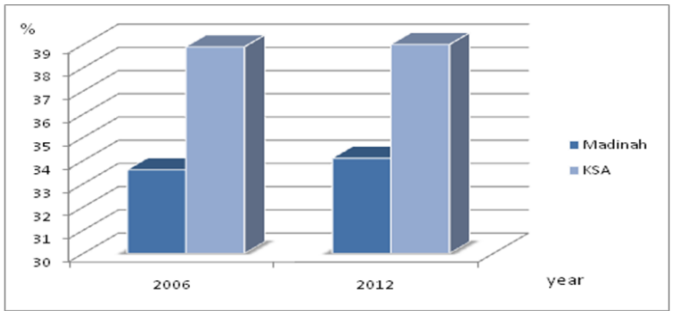

Fig. 11 – Enrolment rates in higher education in Medina and Saudi Arabia in 2006 and 2012.

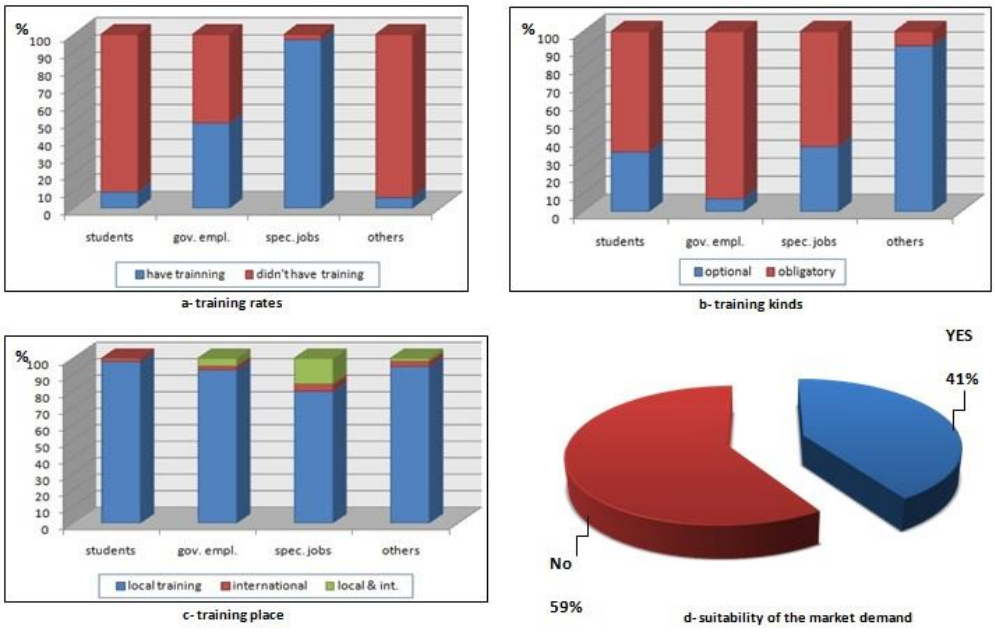

Fig. 12 – Training characteristics of a random sample in Medina.

6.5.2. E-Learning

Plans of digital development implemented by schools and universities in Medina (Medina Ministry of Education, 2015) (259 schools:136 primary schools, 78 medium schools, 45 secondary schools and 2 universities) reflect that there is full digitization, including new methods of ICT (Information and Communications Technology) at the two universities; the majority of the city schools have partial digitization on the way to complete its components according to plans. Also, there are some schools which are in need of these technologies (Fig. 13).

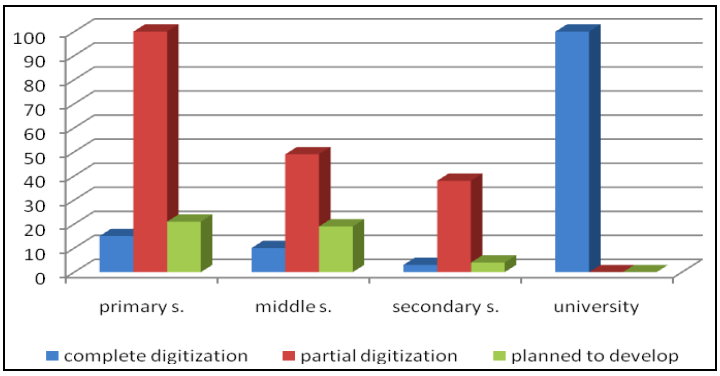

Fig. 13 – Plans of digital development in the schools and universities of Medina 2015.

6.5.3. Creativity and knowledge

Roughly speaking, there was no registered patent in Medina during the last five years (2010 - 2015). The results of field research showed that only 31% of the population sample preferred to read books and 62% were interested in general knowledge. The majority of the subjects did not prefer to connect people outside Saudi Arabia (Fig. 14).

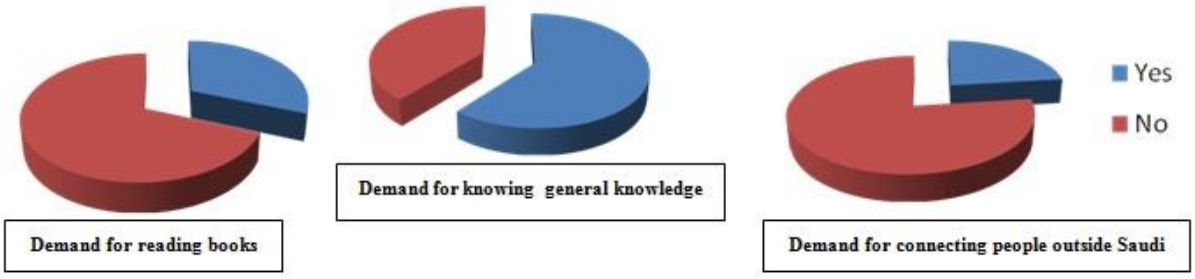

Fig. 14 – The sample population's demand for books, knowledge and connecting people outside KSA.

7. DISCUSSION

Speaking of Medina, the study presented and analyzed some smart city geographical characteristics and demonstrated elements that are a drawback to the city development towards smartness as follows:

- The city governance needs to undertake a clear strategy and have a vision for developments and greater involvement of the private sector in the delivery of services.
- The effective use of GIS, cloud computing and all ICT tools in order to facilitate services and reduce the need for travel.

- Improved access to information through multiple channels – internet, mobile apps, radio, TV and print media.
- Some municipal services, such as water supply and solid waste management should be of very high quality.
- Transport needs a good plan to meet rapid motorization, severe congestion, deteriorating air quality, road accidents and energy waste.
- Citizens of the city are in need of human development training programs because smart citizens build smart cities.

8. CONCLUSIONS

This paper introduces the fundamental concept of smart cities, along with their supporting aspects. It summarizes the *smart cities* characteristics and the distinction between them and other city concepts reported in the literature.

There is a lack of the precise determination of reliable elements for the characterization of smart cities, nor are they given in previous related researches. So, the study proposed a group of characteristics, including factors and indicators derived from public and freely available data and field-work. These characteristics are governance, infrastructures, mobility, quality of life and people. They play the role of Pillars to express the position of Medina and to sharpen its profile from the perspective of transition to a smart city in an non-weighted way.

This study emphasizes the need to incorporate the smart city criteria in Medina which should be taken into consideration.

REFERENCES

Behnam, J., Patel, B.G. (1977), *A method for estimating pedestrian volume in a central business district*, Journal of the Transportation Research, v. **629**, pp. 22–26.

Berardi, U.E. (2015), *Smart Cities: Definitions, Dimensions, Performance, and Initiatives*, Journal of Urban Technology, v. **22**, pp. 3–21.

Campbell, T. (2009), *Learning cities: Knowledge, capacity and competitiveness: Habitat International*, v. **33**, pp. 195–201.

Caragliu, A., Del Bo, C., Nijkamp, P. (2011), *Smart cities in Europe*, Journal of Urban Technology, v. **18**, pp. 65–82.

Cocchia, A. (2014), *Smart and Digital City*, A Systematic Literature Review: Smart City, v. **3**, pp. 19–20.

Coe, A. et. al. (2001), *E-governance and smart communities: a social learning challenge*, Social Science Computer Review, v. **19**, pp. 80–93.

Dameri, R.P. (2013), *Searching for smart city definition: a comprehensive proposal*, International Journal of Computers & Technology, v. **11**, pp. 2544–2551.

ETH, C. (2015), *Thinking Urban Future*, Singapore, ETH center.

Exhibitions, I.G. (2015), *Smarter Solutions for a Better Tomorrow*, Smart City India 2015 Pragati Maidan, New Delhi.

Hafedh C., E.A. (2012), *Understanding Smart Cities: An Integrative Framework*, System Science 45th Hawaii International Conference, IEEE publisher, pp. 2289–2297.

Hollands, R.G. (2008), *Will the real smart city please stand up? Intelligent, progressive or entrepreneurial?*, City, v. **12**, pp. 303–320.

ISO.ORG, I.O.f.S. (2014), *Smart Cities Preliminary Report 2014*, in Technology, I.I.J.I., ed.: Switzerland, pp. 1–71.

Joseph, T. (2014), *Smart city analysis using spatial data and predicting the sustainability*, International Journal of Computer and Technology(IJCTT), v. **12**, pp. 41–45.

Kanter, R.M., & Litow, S.S. (2009), *Informed and interconnected: A manifesto for smarter cities*, Harvard.

Li, D. et al. (2013), *Geomatics for Smart Cities – concept, key techniques and applications*, Geo-Spatial Information Sciences, v. **16**, pp. 13–24.

Ljubljana, D.o.G.U.o. (2007), The final report of a research project of "Smart cities Ranking of European medium-sized cities.

Makki, M.s. (2011), *The impact of urban development on the overall look in Medina*, Saudi geographical society magazine.

Mooij, J. (2003), *Smart governance?* Politics in the policy process in Andhra Pradesh, India, p. ODI Working Papers.
Papanikolopoulos, N.P. (2010), *Practical Methods for Analyzing Pedestrian and Bicycle Use of aTransportation Facility*, Minneapolis,MN, University of Minnesota, Department of Computer Science and Engineering.
Pardo, T., & Taewoo, N. (2011), *Conceptualizing smart city with dimensions of technology, people, and institutions*, the12th Annual International Conference on Digital Government Research New York, ACM., pp. 282–291.
Somayya Madakam, R.R. (2014), *Smart Cities-Six Dimensions*, the Intl. Conference, on advances in computing and information Technology: Inistitute of Research Engineers and Doctors, p. 41.
Stratigea Anastasia, E.A. (2015), *Tools and Technologies for Planning the Development of Smart Cities*, Journal of Urban Technology, v. **22**, p. 43.
Sylvie, D., M.D. (2013), *GeoSmartCity: geomatics contribution to the smart city*, the14th Annual International Conference on Digital Government Research: New York, NY, USA, pp. 65–71
Washburn, D. (2010), *Helping CIOs Understand "Smart City" Initiatives*, Defining the Smart City, Its Drivers, and the Role of the CIO: Cambridge, MA, Forrester Research, Inc., Vartanian.
Water, M.D.O. (2014), unpublished report.
Zollaly, H.A.B. (1998), *Introduction to Environmental Science*, part 1: Air Pollution (in Arabic): Medina, Dar Al Zaman publisher.
*** (2012), *Medina*, Medina Urban Observatory.
*** (2013), *Medina, Results of Urban indicators*, Medina Urban Observatory.
*** (2014), *Health*, M.D.O.G.
*** (2014), *Medina*, Medina Urban Observatory.
*** (2014), *Jeddah*, Saudi Electricity Company.
*** (2015), *Singapore: Thinking Urban Future*, Singapore-ETH Centre, https://www.ethz.ch/en.
*** (2015), *The national Communications and information Technology plan*, mcit., M.o.C.a.i.T., Medina

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SCENARIO DE GESTION DES CRISES EN MILIEU URBAIN – CAS D'EL EULMA (ALGÉRIE)

ABDELWAHHAB FILALI*, MAHDI KALLA**

Key-words: crisis management, GIS, PHAST, simulation.

The crisis-management scenario in urban areas. El Eulma City Case-study (Algeria). The Civil Protection Services are increasingly challenged by crisis management, especially whenever located in areas that have significant spatial dysfunction, spawned by unplanned extensions around the industrial estates as is the case for El Eulma city. Owing to its sizable population and its proximity to hazardous installations, the city has become highly exposed to risks. Therefore, the objective of this work is to develop a decision-support tool in terms of relief management by pairing a PHAST simulation software with a GIS software (ArcGis). The approach is to create a georeferenced database under the MADS spatiotemporal representation, while integrating essential data in a geographical information system. With a view to efficient crisis management, the results reached by the study, have led to the spatialisation of the thermal effects of possible accidents, taking into account the location of all issues at stake. Network analysis has helped defining the shortest pathways for emergency services interventions.

1. INTRODUCTION

Les catastrophes naturelles ou technologiques parviennent n'importe où et à tout moment. Il existe deux méthodes à surmonter ces catastrophes: la première est d'essayer de prévenir leurs survenances et la deuxième est d'avoir un système d'urgence et un plan d'opération pour tous les cas (El-korany et El-bahnasy, 2008), prenant en exemple la ville d'El Eulma qui est de plus en plus confrontée à des crises résultant de la forte imbrication du tissu urbain avec la zone industrielle. La crise est une situation qui se produit soudainement en raison d'un phénomène naturel ou technologique, d'occurrences, d'incidents ou de la force humaine (exceptionnellement dans les domaines de la sécurité sociale statutaire) qui est incontrôlable (Sajadi et Sajadi, 2014).

La gestion de crise est caractérisée par l'incertitude et l'urgence. En effet, elle implique les dispositifs et les contraintes spécifiques en termes de mobilisation prompte de l'information appropriée. Ces types de procédures nécessitent un niveau très élevé de l'interactivité avec la communication et la coordination entre les acteurs (Roche *et al.*, 2013). En outre, l'une des activités de gestion de crise est la planification de secours, qui signifie le transfert des personnes d'un endroit non sécurisé à un autre endroit sécurisé (Shaker Abd El-Hamied *et al.*, 2012). Pour cela, les organes de gestion de la crise commencent à se rendre compte des limites qu'offrent les modèles d'interventions dites classiques. Ainsi il apparaît nécessaire de mettre en œuvre des outils SIG conçus essentiellement pour l'aide à la décision.

L'objectif principal de cette recherche est d'illustrer l'importance de la planification des secours via, d'une part, la simulation d'un accident industriel et d'autre part, comment les systèmes d'information géographique (SIG) peuvent être utiliser en phase de réponse dans une situation de crise à travers la préparation d'un plan d'action visant à permettre un engagement rapide de moyens de secours disponibles. Ce travail a pour but de répondre aux attentes de tous les acteurs, notamment la protection civile dans un double objectif: d'une part, améliorer la connaissance sur les situations accidentelles inhérentes aux risques industriels par l'utilisation du logiciel de simulation (PHAST) et

* Doctorant, Laboratoire LRNAT, Université de Batna, 05 avenue Chahid Boukhlouf 05000, Algérie, filali.abdo@yahoo.fr, abdelwahhabfilali@gmail.com.

** Professeur, directeur de Laboratoire LRNAT, Université de Batna, 05 avenue Chahid Boukhlouf 05000, Algérie, m_kalla1@yahoo.fr.

d'autre part, contribuer à la création d'une base de données géographiques en vue d'optimiser le processus d'intervention à travers l'exploitation d'une Géodatabase ARCGIS/Arcinfo, et des outils du module «spatial analyst» et «network analyst».

2. MATERIELS ET METHODES

2.1. Situation géographique

El Eulma (ex Saint –Arnaud) (Fig. 1) est la deuxième ville de la Wilaya de Sétif par sa superficie et son nombre d'habitants. Située dans les hauts plateaux Sétifiens, sur la route nationale N°5, la ville se trouve à 25 km, à l'Est de Sétif et à 100 km à l'Ouest de Constantine. Elle représente le second pôle économique de la Wilaya, la ville d'El Eulma possède une influence digne d'une grande ville par sa position géographique et son potentiel économique régional.

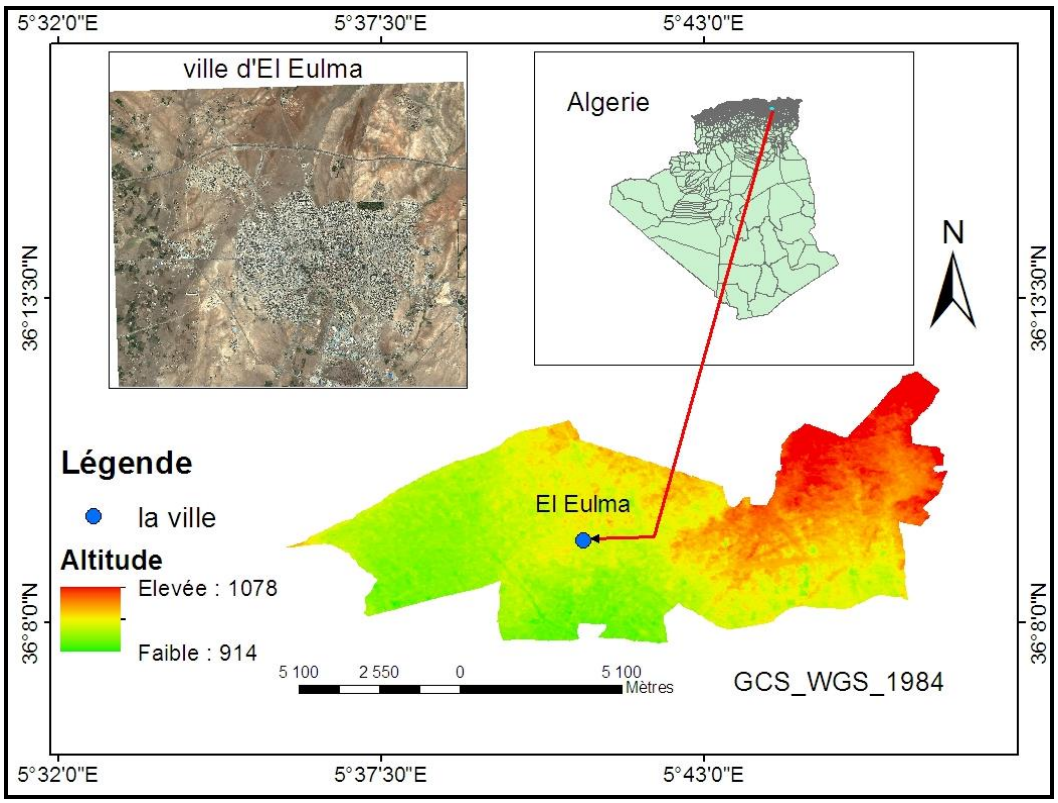

Fig. 1 – Ville d'El Eulma: Situation géographique.

La ville a connu une rapide croissance spatiale et démographique, cette croissance n'a pas pris en compte les risques que peut subir le milieu. Selon le Recensement Général de la Population et d'Habitat (RGPH), elle regroupe 141 920 habitants en 2008 et une population estimée à 181 856 habitants en 2015 selon la direction de la programmation et du suivi budgétaire (DPSP) de la wilaya de Sétif, dont 6 450 personnes exercent leurs activités dans le secteur de l'industrie. Une zone industrielle localisant les activités économiques est marquée par une prédominance du secteur privé (chimie, matériaux de construction, plastique, agroalimentaire…) et le secteur public (produits pétroliers et gaziers sous forme d'unité de stockage et de distribution). En matière d'infrastructure, on

note la présence d'un réseau d'axes routiers importants, dont deux routes nationales N°5 et N°77 qui traversent la ville, une autoroute au nord de la ville et un chemin de fer traversant la zone industrielle. Cette situation génère une grande vulnérabilité en cas d'un dysfonctionnement grave de système de sécurité urbain.

2.2. La méthodologie

La méthodologie adoptée repose essentiellement sur une approche systémique, cette dernière présente deux aspects fondamentaux. Dans un premier temps, il s'agit de la modélisation des phénomènes accidentels à l'aide des logiciels de simulation. Parmi les nombreux outils disponibles, nous avons choisi le logiciel PHAST (Process Hazard Analysis Software Tool) qui est capable de simuler l'évolution du rejet accidentel d'un produit toxique et/ou inflammable. Ensuite, la dimension cartographique s'avère nécessaire pour la réalisation d'outils cartographiques opérationnels à l'aide des Systèmes d'Information Géographique. Les données utilisées dans cette étude ont un caractère spatial et attributaire, ces données ont été digitalisées sous forme de fichiers de forme sur une image satellite. Le Plan Directeur d'Aménagement et d'Urbanisme (PDAU) fourni par l'administration locale a permis d'attribuer à l'ensemble des couches d'information leur propriété sémantique comme le montre le schéma suivant (Fig. 2).

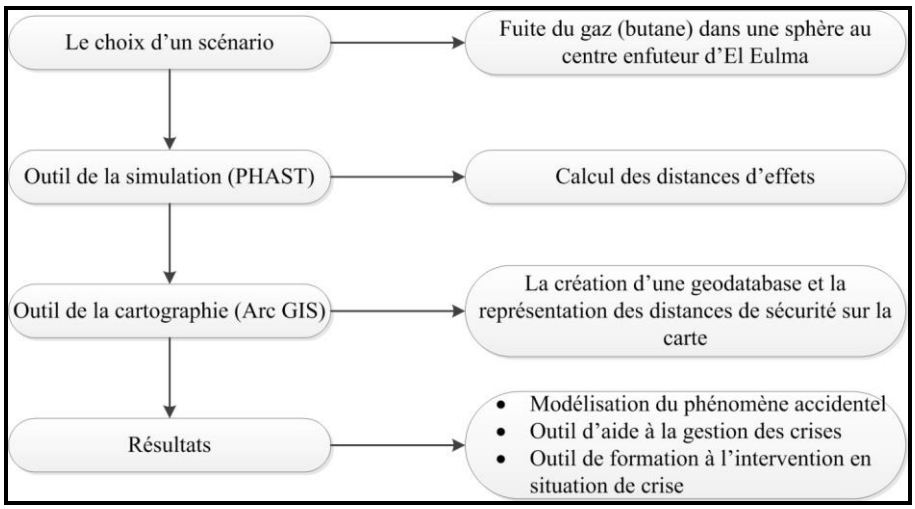

Fig. 2 – Organigramme de la méthodologie adoptée.

2.3. La simulation d'un scenario

La simulation d'un scénario joue un rôle primordial dans l'aide à la gestion de la crise. Selon (Walker *et al.*, 2011) les scénarios sont principalement des dispositifs de communication, bien qu'ils ne réduisent pas les incertitudes inhérentes à décrire un état futur du monde, ils rendent les situations plus concrètes, ainsi les utilisateurs peuvent traiter une stratégie de réponse ou un système de gestion proposé de crise dans un ensemble cohérent et plausible de circonstances. Le choix du scénario s'est fait sur le phénomène du BLEVE (Boiling Liquid Expanding Vapour Explosion), qui signifie la vaporisation instantanée et totale d'un liquide surchauffé sous pression lorsque la capacité le contenant est brutalement dépressurisée à la pression atmosphérique (UFIP, 2002). Pour la mise en évidence du scénario, nous nous sommes basés sur une modélisation systémique, qui se traduit comme tout système ou phénomène complexe pouvant être représenté par un système d'actions multiples. Le

concept général représentant l'action est le processus. Le processus définit les changements qui affectent les objets, ces changements pouvant intervenir dans le temps, l'espace, la forme ou la nature (Legros, 2009).

L'étude de la dispersion atmosphérique des nuages de gaz fait appel à des logiciels de simulation. Parmi l'ensemble des outils disponibles sur le marché, nous avons opté pour le logiciel PHAST qui répond aux objectifs de l'étude et consiste à estimer le rayon d'explosion d'une sphère du gaz butane au sein du centre enfûteur d'El Eulma lors d'une libération accidentelle probable (Fig. 3).

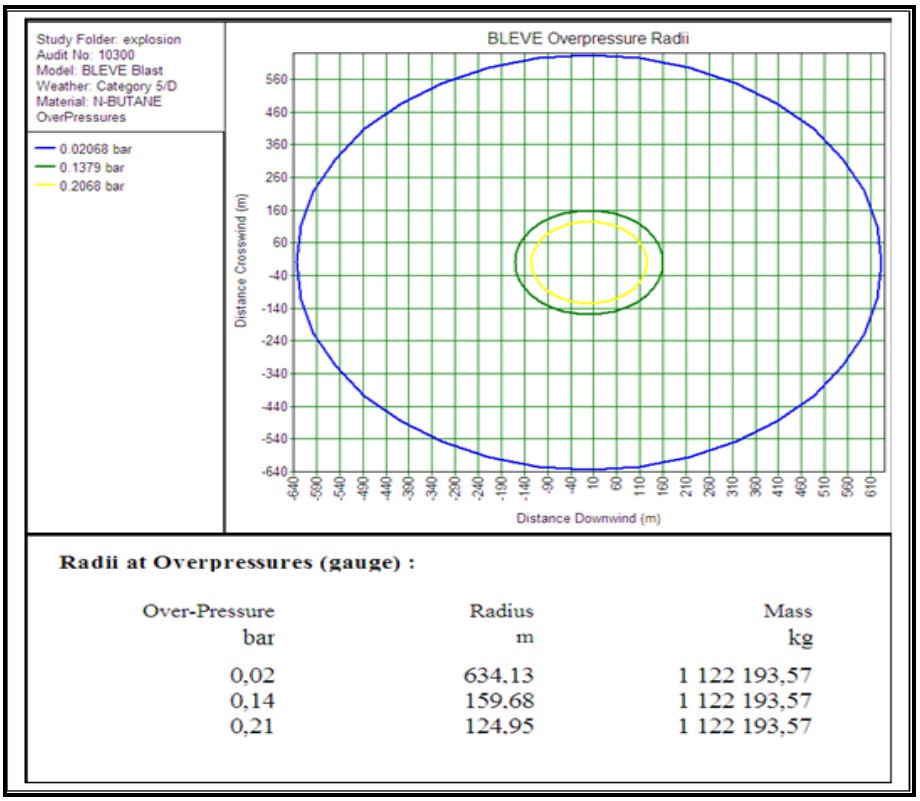

Fig. 3 – Représentation des enveloppes d'un BLEVE.

Les distances d'effets peuvent atteindre un rayon de 635 m, il est également à noter la présence des installations avoisinantes qui sont touchées directement par le phénomène du BLEVE, ce qui peut provoquer un effet domino.

2.4. Mise en œuvre du SIG pour la gestion et le suivi des risques

Les SIG peuvent également être utilisés dans le processus d'aide à la prise de décision en cas de crise. Cette technologie a la capacité d'acquérir les données par la digitalisation, la scannérisation, l'imagerie numérique ou la photographie aérienne pour stocker, manipuler, former des questions, analyser et d'une manière importante, pour visualiser les données. En d'autres termes, la technologie SIG apporte à l'utilisateur la capacité d'intégrer, stocker, traiter et produire l'information géographique. Ce système prend une multitude de données de nombreuses sources et montre géographiquement l'information (Gunes et Kovel, 2000). La mise en place du SIG nécessite la conception d'une base de données géoréférenciées, tout en identifiant les couches d'informations indispensables ainsi que les interactions entre celles-ci.

Les différentes interactions sont assurées par un modèle conceptuel de données qui permet de représenter la structure d'un système d'information du point de vue des données et de définir également les relations entre ces différentes données (Zoghlami, 2013).

La modélisation géographique réalisée dans cette étude s'appuie sur le formalisme spatio-temporel MADS. L'approche MADS est fondée sur le concept d'orthogonalité, c'est-à-dire «la décomposition d'un phénomène complexe en différents éléments pouvant être perçus indépendamment les uns des autres » (Parent *et al.*, 2006).

Dans le cadre de cette recherche, un modèle conceptuel de données a été élaboré selon la représentation MADS (Fig. 4). Ce modèle offre la possibilité d'opérer les relations spatiotemporelles entre les différents objets de la base de données géographiques nécessaire à l'analyse spatiale du phénomène.

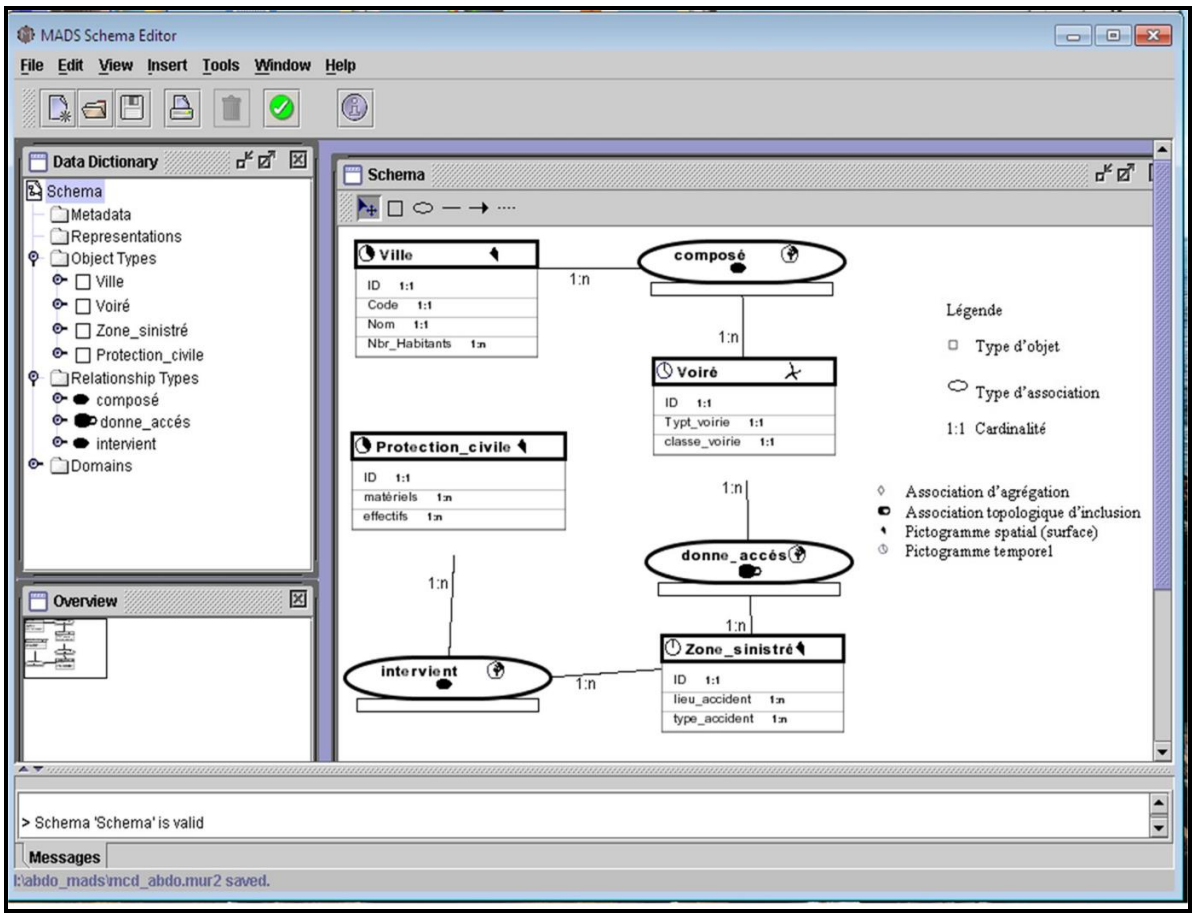

Fig. 4 – Le modèle conceptuel de base de données géographiques.

3. RÉSULTATS ET DISCUSSIONS

3.1. L'utilisation de l'analyse spatiale dans la cartographie de l'alea

L'analyse spatiale est une démarche qui inclut des techniques formelles qui étudient des objets géographiques en utilisant leurs propriétés topologiques ou géométriques. Donc c'est une activité qui constitue souvent une finalité du SIG, notamment au niveau de la préparation de la décision (Essevaz-Roulet *et al.*, 2008).

Les résultats issus du logiciel PHAST (Distances d'effets) seront exportés et cartographiés sur la carte à l'aide de l'outil anneaux concentriques multiples qui fait partie de nombreux outils de géotraitements proposés par ArcToolbox (Fig. 5).

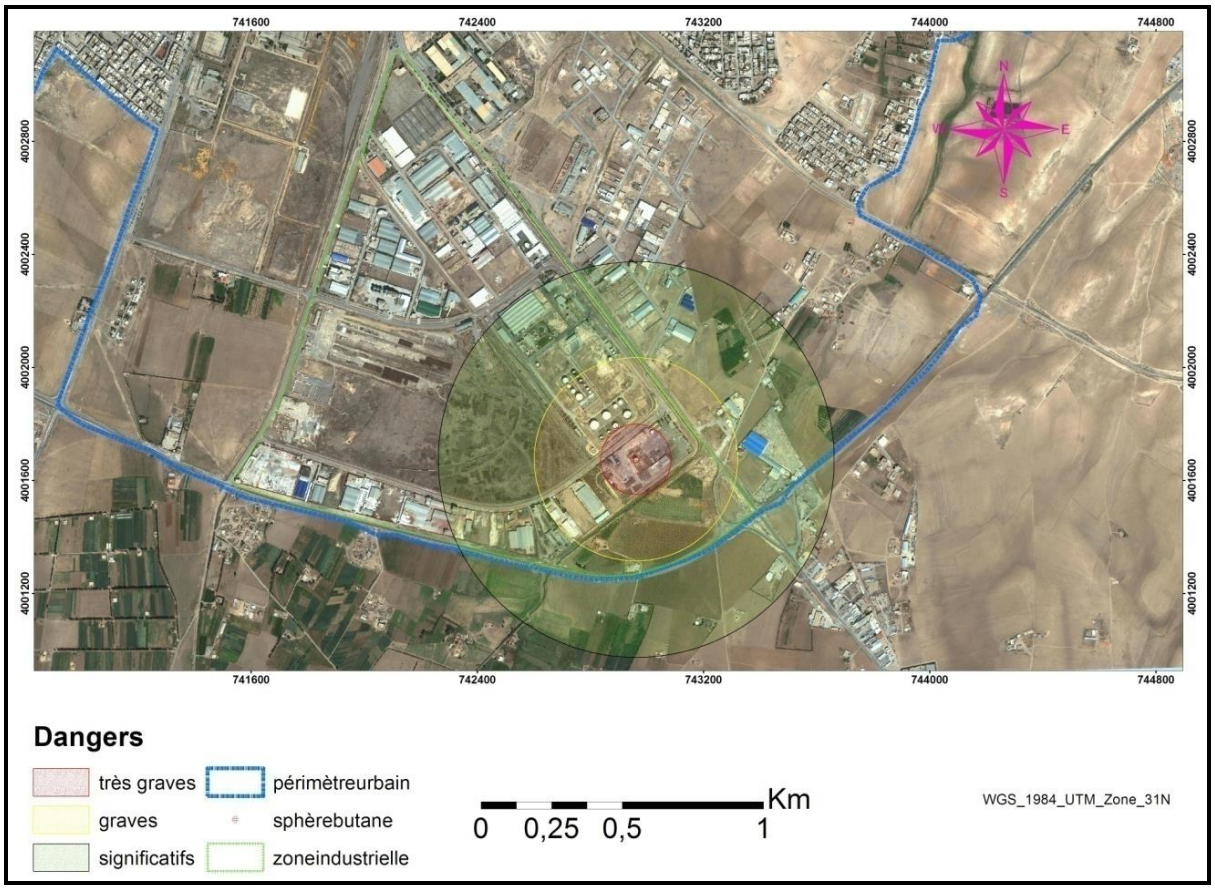

Fig. 5 – Enveloppe des intensités d'effet thermique
d'un BLEVE (Ville d'El Eulma).

Le périmètre à risque a été défini en fonction de la nature et la quantité du produit manipulé et stocké (sphère du gaz butane de 2 000 m³). L'effet thermique du BLEVE est représenté par trois enveloppes distinctes, qui engendrent des conséquences significatives, voire très graves (mortalités, blessures).

3.2. Cartographie des enjeux

Des logiciels de calcul des effets d'accidents couplés à des SIG fournissent une estimation des distributions spatiales de ces effets à l'intérieur desquelles les cibles sont recensées (Leeming et Saccomanno, 1994), (Pet-Armacost *et al.*, 1999), (Levesque, 2000). La (Fig. 6) montre la spatialisation de l'ensemble des enjeux recensés à l'intérieur du périmètre du danger.

Pour déterminer les enjeux exposés directement au BLEVE, l'opération consiste à fusionner la couche enjeux avec celle des anneaux concentriques multiples à l'aide de l'outil Intersecter d'ArcToolbox.

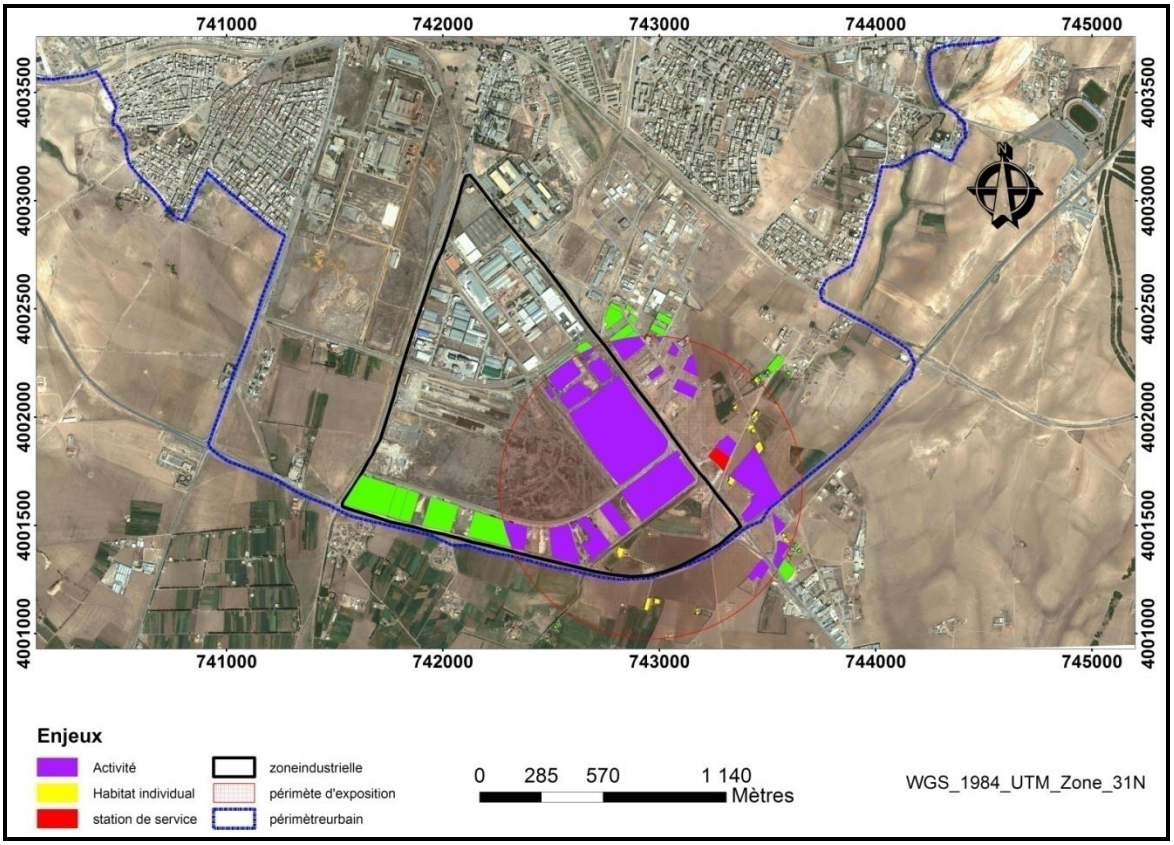

Fig. 6 – Enjeux présents dans le périmètre de danger (Ville d'El Eulma).

3.3. Modélisation et gestion des crises

La minimisation du temps de décision en cas de crise est un facteur crucial pour sauver des vies humaines, des biens et des coûts (Tolly *et al.*, 2015). La technologie SIG peut jouer un rôle important dans la gestion des secours parce qu'elle a la capacité de rehausser des systèmes d'informations de gestion des secours par la numérisation, le stockage, l'analyse et la manipulation des données (Senior et Copley, 2008).

En ce qui concerne le cas de l'Algérie, l'organisation des interventions et des secours repose essentiellement sur la concrétisation du plan dit "ORSEC".

Ce plan, prévu par la législation algérienne, notamment Le décret 85-231fixant « les conditions et les modalités d'organisation de la mise en œuvre des interventions et secours en cas de catastrophes », de ce fait, prévoit l'ensemble des moyens humains et matériels mobilisables pour faire face à différentes calamités naturelles ou d'ordre public.

Pour permettre une certaine visibilité de la prise de décision en situation de crise, nous avons opté pour l'extension ArcGIS Network Analyst qui permet, en effet d'analyser le réseau du transport, basé sur une couche de polyligne représentant les routes (Lacroix, 2013). Le principe de cette extension est de trouver des cheminements, tout en tenant compte d'assurer un meilleur routage à moindre coût et la détermination des itinéraires d'évacuations (Fig. 7) (Yang Bo *et al.*, 2009), estiment que l'évacuation de secours est une mesure importante pour empêcher et réduire les dommages pendant l'urgence à grande échelle. Ils ont supposé que l'efficacité de l'évacuation est basée d'une part, sur la compréhension de la situation et d'autre part, sur l'analyse fiable de l'information.

Après la survenance d'un accident, la planification de contingence doit être appropriée, efficace et en temps opportun aux besoins des populations et les installations touchées. De ce fait, nous avons procédé à générer deux itinéraires, le premier débute du siège de la protection civile vers la zone sinistrée, et le second de cette dernière vers l'hôpital pour assurer une meilleure évacuation des sinistrés.

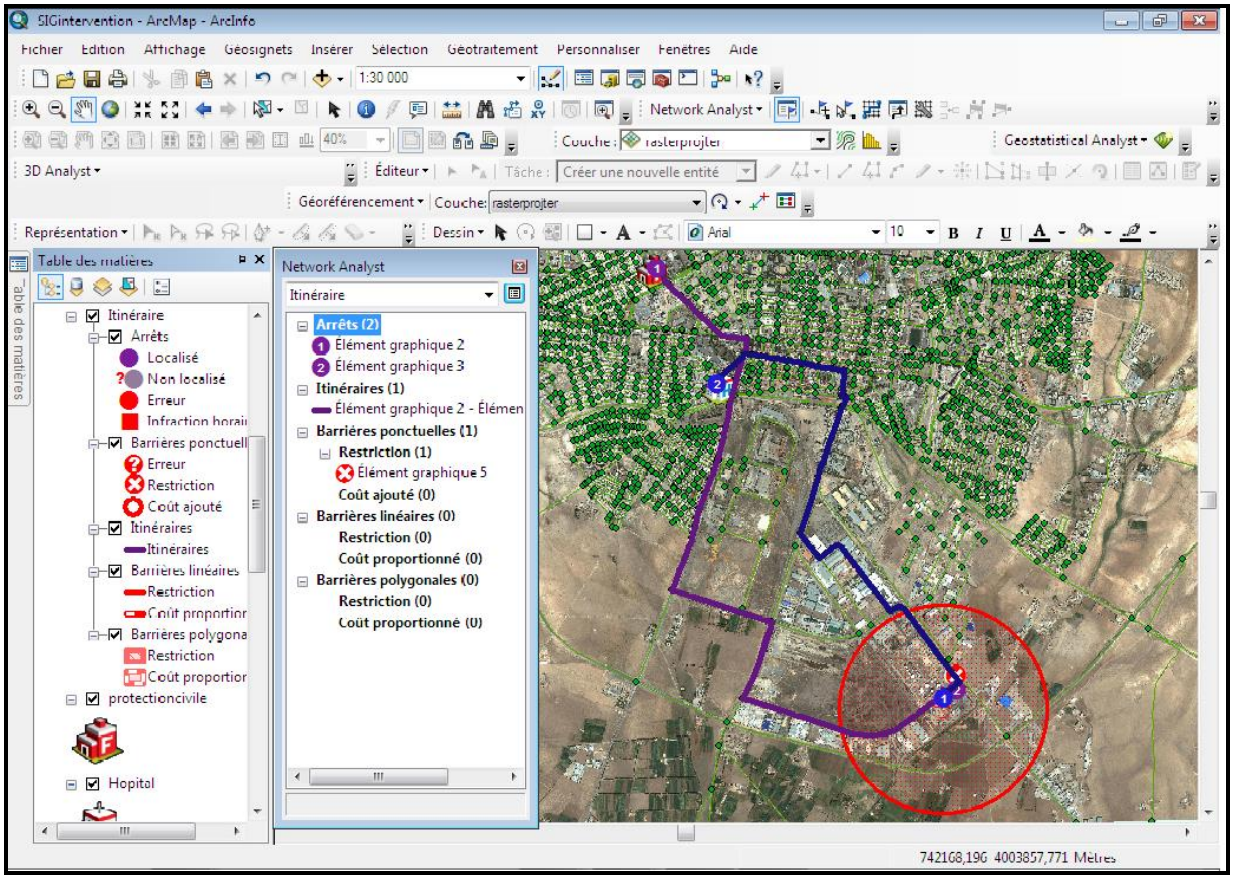

Fig. 7 – Organisation des secours.

4. CONCLUSION

À la lumière de cette recherche, le verdict semble clair pour le territoire d'El Eulma qui représente un dysfonctionnement spatial important. Il est également à noter la pertinence des SIG dans le contrôle et la gestion des situations d'urgences ainsi que l'amélioration de l'efficacité d'évacuation en situation de crise.

Afin que les acteurs de la sécurité civile puissent gagner une intervention au moment de crise, ils doivent avoir une compréhension complète sur la situation. La simulation et l'anticipation des crises peuvent constituer des voies intéressantes qui pourront servir à leur gestion. En s'appuyant sur cette simulation nous avons défini un outil qui optimise la mise en œuvre de ce plan. L'outil mis en place est sous forme de cartes, ces cartes sont utiles pour déterminer le périmètre sensible, préciser les enjeux d'ordre humains et économiques qui s'y localisent et le plus important de tracer des itinéraires d'intervention et d'évacuation.

La démarche proposée constitue une alternative intéressante aux méthodes d'intervention classiques. Cette approche peut faire l'objet d'une utilisation par d'autres villes de l'Algérie qui présentent pour la majorité un profil industriel similaire à notre zone d'étude. Ceci appelle

évidemment à l'introduction de nouveaux moyens d'analyse spatiale basée essentiellement sur l'utilisation des techniques de géomatique, en particulier les bases de données géographiques qui constituent un outil géodécisionnel.

NOTES. Le décret 85-231fixant « *les conditions et les modalités d'organisation de la mise en œuvre des interventions et secours en cas de catastrophes* ».

BIBLIOGRAPHIE

Abeer, El-Korany, Khaled El-Bahnasy (2008), *A multi-agent Cooperative Model for Crisis Management System*, 7th WSEAS Int. Conf. on artificial intelligence, knowledge engineering and data bases (AIKED'08), University of Cambridge, UK, Feb. 20–22, ISSN: 1790-5109, ISBN: 978-960-6766-41-1, pp. 170.

Essevaz-Roulet, M., Iratchet, B. (2008), *La mise en œuvre d'un SIG dans les collectivités territoriales*, Territorial Editions, 35 p.

Gunes, A.E., Kovel, J.P. (2000), *Using GIS in Emergency Management Operations*. Journal of Urban Planning and Development, **126**, pp. 136–149. http://dx.doi.org/10.1061/(ASCE)0733-9488(2000)126:3(136).

Lacroix, P. (2013), *Contributions of GIS to Efficient Mine Action*, thèse de doctorat, Université de Genève, 143 p.

Leeming, D.G., Saccomanno, F.F. (1994), *Use of quantified risk assessment in evaluating the risks of transporting chlorine by road and rail*, Transportation Research Record, n°**1430**, pp. 27–35.

Legros, D. (2009), *Maîtrise des risques dans les systèmes de transport: Proposition d'une nouvelle approche de modélisation dynamique*, l'école nationale supérieure des mines de paris, thèse de doctorat, 76 p.

Levesque, A. (2000), *Le transport de marchandises dangereuses en milieu urbain*, Treizièmes Entretiens Jacques Cartier "L'intégration des marchandises dangereuses dans le système des déplacements urbains", 43–46. In: Transport de matières dangereuses 1995–2002, Dossiers du CDAT, Ministère de l'Equipement, des Transports, du Logement, du Tourisme et de la Mer, juin 2002, vol. **2**, pp. 377–380.

Parent, C., Spaccapietra, S., Zimànyi, E. (2006), *Conceptual modeling for traditional and spatio-temporal applications, the MADS approach*, Springer Editions, Berlin, Germany, 465 p.

Pet-Armacost, JJ., Sepulveda, J., Sakude, M. (1999), *Monte Carlo sensitivity analysis of unknown parameters in hazardous materials transportation risk assessment*, *Risk analysis*, vol. **19**, n°*6*, pp. 1173–1184. DOI: 10.1111/j.1539-6924.1999.tb01136.x.

Roche, S, Propeck-Zimmermann, Eliane, Mericskay, B. (2013), *GeoWeb and crisis management: issues and perspectives of volunteered geographic information*, GeoJournal ISSN 0343-2521, **78**, *1*, pp. 21–40, DOI 10.1007/s10708-011-9423-9.

Sajadi, J., Shima, Sajadi, J.M. (2014), *Geoinformatics (GIS and RS) Applications in Crisis Management*. International Journal of Civil and Environmental Engineering, **36**, *2*, pp. 1255–1260, ISSN: 1701-8285.

Shaker Abd El-Hamied, Sara, Abou El-Fotouh Salah, A., Asem, Aziza (2012), *Survey on Using GIS in Evacuation Planning Process*, International Journal of Computer Science and Information Security, **10**, *8*.

Senior, A., Copley, R. (2008), *Developing a new system for recording and managing information during an emergency to aid decision making*, Journal of Business Continuity and Emergency Planning, **2**, *3*, pp. 267–280.

Tolly, D., El Rhalibi, A., Carter, C., Sudirman, S. (2015), *Hybrid 3D rendering of large map data for crisis management*, ISPRS International Journal of *Geo-Information*, **4**, pp.1033–1054, DOI: 10.3390/ijgi4031033.

UFIP (2002), *Stockages et dépôts de produits liquides et liquéfiés*, guide méthodologique pour la réalisation des études de dangers en raffineries, 23 p.

Walker, WE, Giddings, J., Armstrong, S. (2011), *Training and learning for crisis management using a virtual simulation/gaming environment*, DOI 10.1007/s10111-011-0176-5.

Yang, B., Wu, Y.G., Wang, C. (2009), *A multi-agent and GIS based simulation for emergency evacuation in park and public square*, IEEE.

Zoghlami, Asma (2013), *Modélisation et conception de systèmes d'information géographique gérant l'imprécision*, Université Paris8, thèse de doctorat, 41 p.

Reçu 27 mai 2015

THE 33rd INTERNATIONAL GEOGRAPHICAL CONGRESS "SHAPING OUR HARMONIOUS WORLDS"

AUGUST 21–25, 2016, BEIJING, CHINA

The Congress, organized by the International Geographical Union, together with the Geographical Society of China and the Institute of Geographic Science and Natural Research (CAS) of the Chinese Academy of Sciences held in Beijing, was attended by 5,000 participants from over 100 countries.

The Congress theme was "Shaping Our Harmonious Worlds". The discussions, held in over 200 sessions, highlighted current scientific trends in various geographical areas.

The opening ceremony awarded the students who had taken part in the International Geographical Olympiad. The Romanian delegation, co-ordinated by Mihaela Cornelia Fiscutean and Dorin Fiscutean, teachers at the National College in Iassy, obtained 4 medals (2 gold medals: Maria-Sabina Calisevici – "Ştefan cel Mare" National Military College in Câmpulung Moldovenesc and Ioan-Adrian Toma – "Unirea" National College in Focşani; 1 silver medal: Radu Artiom – "Jean Monnet" Theorethical Lyceum in Bucharest, and 1 bronze medal: Sorina Avădanei, "Calistrat Hogaş" National College in Piatra Neamţ.

More than 20 Romanian researchers and University teaching staff from Bucharest, Cluj-Napoca, Iaşi and Timişoara presented several scientific papers.

Throughout the Congress proceedings, besides the sessions of communications, the General Assembly meetings, attended by the representatives of the National Committees gathered to elect a new IGU President, designated Prof. Yukio Himiyama (Japan) for this position, and also naming five new vice-presidents: Joos Droogleever-Fortuijn – The Netherlands, Barbaros Gönençgil – Turkey, Nathalie Lemarchand – France, RB Singh – India and Rémy Tremblay – Canada. The venue of the 2024 IGU Congress will be Dublin (Ireland). In 2020, the Congress venue will be Istanbul (Turkey), while in 2022, Paris (France) will host an Extraordinary Congress occasioned by the anniversary of the IGU Centennary.

After the Beijing Congress, organized a number of four thematic field surveys, were organized as follows: arid areas, inclusive of the Gobi Desert and the North-West of China; the Tibetan culture (Tibet, Lhasa); water resources (Yangtze River and the Dam of the 3 Defiles) and the karst relief (Li River, Yunnan National Park).

Dan Bălteanu, Monica Dumitraşcu

Rev. Roum. Géogr./Rom. Journ. Geogr., **60**, (2), p. 213–215, 2016, Bucureşti.

THE ANNUAL MEETING OF THE IGU COMISSION ON LOCAL AND REGIONAL DEVELOPMENT,

AUGUST 16–19, 2016, VLADIVOSTOK, RUSSIAN FEDERATION

An important scientific event organised in the framework of the International Geographical Union (IGU), the **Annual Meeting of the Commission on Local and Regional Development**, was held in Vladivostok, Russian Federation (16–19 August). The conference was jointly organized by the Pacific Geographical Institute, Far Eastern Branch of the Russian Academy of Sciences (FEB RAS), Far Eastern Federal University (FEFU) and the IGU Commission on Local and Regional Development.

The Scientific Committee of this scientific event was made up of leading scientists and professors of the Russian scientific society based in Vladivostok and preeminent members of the IGU Local and Regional Development Commission: Acad. Petr Baklanov, Pacific Institute of Geography FEB RAS, Vladivostok; Prof. Petr Brovko, FEFU, Vladivostok; Prof. Evgeny Novoseltsev, Far Eastern Marine Research Institute, Vladivostok; Prof. Michael Sofer, Department of Geography and Environment, Bar-Ilan University, Israel (then Chair and current honorary member of the Commission); Prof. Jerzy Banski, Institute of Geography and Spatial Organization, Polish Academy of Sciences (the incumbent Chair of the Commission) and Prof. Anthony Sorensen, School of Human and Environmental Studies, University of New England, Australia.

The meeting gathered around 20 scientists from 5 countries (Russia, Israel, Poland, Romania, and USA).The main topics targeted general aspects of local and regional development, urban-rural linkages, as well as illustrative examples from Far East Russia and worldwide, grouped into three sections: I. Issues of local and regional development in the rural space II. Theoretical issues in regional Development III. Case studies in regional development IV. Regional development in Pacific Russia.

The conference agenda also included a round table on the Development Strategy of Vladivostok City Agglomeration for 2020–2030 which was hosted by the Far East Federal University, where the participants were able to argue on the strategic priorities and scenarios of socio-economic development of the city. During the last two days of the event, two field trips were organised. The focus was on the main development clusters of the Far East Russia: industrial and sea transportation (Nakodka – the largest industrial and transport harbour, Kozmino Bay, the terminal point of the Eastern Siberia – Pacific Meridian pipeline and Vostochny Sea Port – part of the eastern branch of the Trans-Siberian railroad) and former agricultural and mining areas subject to new regional development projects – Territories of Advanced Development – NAD (Ussuriisk – Mikhailovsky areas).

On behalf of the Institute of Geography, Romanian Academy two scientific papers were presented: "*Urban growth related to distance explanatory factors in Bucharest Metropolitan Area. Spatial and temporal assessment using logistic regression*" (I. Grigorescu, Gh. Kucsicsa) and "*Farming practices and policies in shaping the metropolitan agriculture in the Southern Romania*" (A. Popovici, I. Grigorescu, B. Mitrică, I. Mocanu, M. Dumitrașcu).

The next annual meeting of the IGU Commission on Local and Regional Development is projected to be held in Romania (September 11–15, 2017). It event be integrated into a larger scientific conference organized in the framework of the IGU which will gather three Commissions: Land Use/Cover Change, Local and Regional Development and Biogeography and Biodiversity.

Ines Grigorescu

THE 11th EUROPEAN CONFERENCE ON APPLIED CLIMATOLOGY (ECAC), SEPTEMBER 12–16, 2016, TRIESTE, ITALY

The 16th EMS Annual Meeting & the 11th European Conference on Applied Climatology (ECAC) was held in Trieste, Italy, on 12–16 September 2016. The Conference was organized by **Copernicus Meetings** in co-operation with the Unione Meteorologica del Friuli Venezia Giuglia ONLUS (UMFVG), the Consiglio Nazionale delle Ricerce – Istituto di Scienze Marine (CNR-ISMAR), the International Centre for Theoretical Physics (ICTP), the EUMETNET Climate Programme and EUMETNET Working-Group of European Forecasters, and **the European Meteorological Society (EMS).** The Conference was also supported by all Italian EMS Member Societies.

This year, the theme of the Conference was "**Where atmosphere, sea and land meet: bridging between sciences, applications and stakeholders**". The Conference explored the ways and means to support stakeholders, practitioners and decision-makers to mitigate as far as possible future environmental change and to adapt to it where and when necessary.

Many issues on safety, socio-economic impacts and infrastructure investments are particularly urgent in coastal areas. These issues are linked to the changing atmospheric and oceanic circulation, sea level rise, extreme events, floods and landslides.

The ECAC theme 2016 explored these intertwined issues with special emphasis on the sea-atmosphere-land interactions and transitions. Assessing and predicting the evolution of the environment and its impacts are topics that go hand-in-hand with developing solutions to support risk assessment, preparedness and mitigation.

The main areas covered by this scientific event were: *Climate:* Chair Inge Auer (ZAMG Austria), *Applications of meteorology*: Chair Will Lang (UK MetOffice), *The atmospheric system and its interactions*: Chair Renate Hagedorn (DWD Germany), *Communication and education*: Chair Tanja Cegnar (SEA Slovenia), *Measurements and observations*: Chair Frank Berich (DWD Germany) and, *Numerical weather prediction*: Chair Andrea Montani (ARPA-SIMC, Italy).

The session programme included 265 posters and 450 oral presentations organized in 46 sessions. Time slots for 1-minute express-talks to briefly introduce the content of poster presentations were scheduled for all sessions, mostly within oral block, or at the start of the poster session.

At the plenary **ECAC Symposium on Climate Change – Adaptation and Mitigation**, a panel was organized with the audience. Questions such as: How can COP21 target be met? What does the target mean for climate change research and for climate services? What is the relevance of links between NGOs and science? What are mitigation options and is geoengineering a viable approach? – were addressed to and discussed with the audience.

The Conference also featured a small exhibition of commercial companies, involving manufacturers of meteorological instruments.

The 16th EMS Annual Meeting & the 11th European Conference on Applied Climatology (ECAC) was a great success, being attended by 637 participants from 45 countries. Romania was represented by 10 scientists. The Institute of Geography, Romanian Academy, had two scientific posters: *Communicating changes in frost days and the frost-free season in the Romanian Plain to support end-users' decisions in agriculture*, authors: Constanţa Boroneanţ, Mihaela Sima, Diana Dogaru, Dana Micu, and Elena-Ana Popovici, in the SE1/CE8 session: *Creating national and regional climate services in Europe through partnerships* (co-organized), and *Synoptic climatology of heavy precipitation in an active landslide region of Romania (The Curvature Carpathian-Subcarpathian region)*, authors: Dana Micu, Simona Andrei, Mihai Micu, Răzvan Zarea, and Florica Toanca, in the ASI session: *Atmospheric hazards*.

The next upcoming EMS & ECAM 2017 will take place in Dublin, Ireland, on September 4–8, 2017.

Constanţa Boroneanţ

Sorin Geacu, *Dropia în România. Studiu Biogeografic* (The Great Bustard in Romania. A Biogeographical Study), Editura Academiei Române, Bucureşti, 2016, 217 p., 55 figs., 32 colour plates, 39 tables, 485 references, summary in English.

As we have already been accustomed by Mr. Geacu's valuable publications, this time the author has intended, and succeeded, to ofer us, with competence and perseverence, a complex and extremely well-documented analysis of the subject tackled. The results emphasise the importance of a biogeographical approach to the spatial distribution and dynamics of this species, closely correlated with its ecological requirments, environmental factors and the effects of human activity. Although this bird, of impressive size and original way of life, has exerted a particular attraction on both nature-lovers and hunters, no comprehensive work in the Romanian literature has so far been produced. Information on the presence of the Great Bustard in various regions of the country and the dynamics of its population are but fragmented and dispersed in various publications (some of them little accessible), forestry and cynegetic archives, or in works on Romania's avifauna in general.

The present work, which fills a gap in knowledge about this species, represents a comprehensive monograph based on asiduous research into library and archive holdings, data obtained from specialists in county museums, forestry and cynegetic institutions, higher-education establishments and information gathered from villagers and townsfolk from the south and east of Romania. Noteworthy, many information obtained from people acqainted with, or directly participating in actions and censuses connected with Great Bustrad effectives, would have been for ever lost had not the author persevered in finding them.

The first part of the monograph presents morphological and biometric data and gives information on the species' reproduction and ecology. Climatic influences, especially the negative effects of glazed frost that immobilises the wings, making the birds highly vulnerable in frosty winters, are discussed at large.

A vast chapter, based on statistical data, deals with the dynamics of the species' population in Romania. The fluctuation of effectives is followed until 1997, when the Great Bustard started being a stable species in the fauna of this country. However, sporadic occurrences (isolated specimens or small, unstable flocks coming temporarily from neighbouring countries for longer or shorter periods of time) are still recorded. The complex causes that generated this situation are analysed and the efforts made to protect the species (some little known and unfortunately failed) by setting up nature reserves, are recorded.

The second part of the work makes a very detailed time-and-space analysis at regional, county and local levels, of the presence of the species in each landform unit and county, begining with the first available information on numerical fluctuations and exact places in which flocks, or isolated specimens, were observed. For exemple, in certain sectors of the West Plain, but also in the Boian Plain and the Bărăgan Plain, Great Bustard effectives would locally increase for short periods of time due to poaching control and measures to ensure the necessary food. But, what followed in the last two decades of the 20th century was a steep numerical fall of effectives down to complete disappearance. Extremely valuable information are offered on recent Great Bustard occurrences on Romanian territory (very accurately noted on detail maps), which contribute to elucidating the species` state-of-the-art, fairly uncertain in the geographical literature until the publication of the present volume. Beside sporadic occurrences in the Romanian Plain and in Dobrudja (birds flowing in from Ukraine) and the Vinga Plain, the author reports on a very narrow temporary area in Crişana region, between Salonta Town and the Hungarian border. Here, Great Bustards, coming from the neighbour country, would be signalled almost every year, setting temporarily and occasionally even nesting in this territory.

The work is illustrated with numerous maps and graphs, highly suggestive being those on the dynamics of various territorial units. The 67 colour photos (grouped by 32 plates) complete successfully this volume, enabling the reader to appreciate the aesthetic value of this species, which is almost totally lost from Romania`s faunistic heritage. One can see impressive Great Bustard specimens (males, females and offsprings) held in museal collections or learning institutions, eggs, habitat and even a few photos with flying birds. In addition, some pictures of people locally engaged in Great Bustard protection, are also included.

However, we may hope that this work, so very well-documented, might be another argument in favour of an initiative to reintroduce this species (such as has been done rather successfully, we might say, with the beaver, the marmot and the European bison) in a proper landscape and secure corresponding protection and upkeep

measures. Such an initiative would fall in line with current trends in recapturing the values of the European natural heritage.

Cristina Muică

Mirela Paraschiv, *Persoanele fără adăpost în București. Studiu de Geografie Umană* (Homelessness in Bucharest. A Study of Human Geography), Bucharest University Press, Bucharest, 2016, 274 p., 102 figs.

Social Geography continues to represent, unfortunately, one of the least studied geographical fields in Romania. Even worse is that some geographers, even among young researchers, who should support broader approaches to the subject of the science they serve by tackling new topics and ensure the geographical impact, maintain an obtuse and obsolete research perspective, by limiting their scientific actions to descriptive and unidirectional studies.

In this context, the present book is a daring, pioneering, study in Romanian Geography, aiming to break the barriers imposed by prejudices and contributing to widening the geographical horizon at its interface with sociology through a complex, multidisciplinary approach to one of the contemporary urban phenomena: *poverty*.

Not coincidentally, the first chapter of the paper focuses on defining poverty and urban poverty, in particular, and on determining its typologies and territorial effects, as well as and also the directions of alleviating poverty in relation to its specificity at territorial level. Homelessness, as a social impact of urban poverty, is theoretically analysed in the second chapter.

The second part of the book centres on poverty and homelessness at macro-territorial level, highlighting their specificity inside the European Union and Romania. In Romania *austerity* imposed in the last part of the socialist period, was an attempt at rebalancing the budget (payment of foreign debts); *another austerity* episode market the transition period, when the generalized economic and social decline supposed the accumulation of new foreign debts; once more, *austerity* after 2008 was recorded against the background of the global economic crisis. Both phenomena are analysed at territorial level, in relation to housing characteristics and the local economies, more or less vulnerable to the challenges posed by the national and global political and economic context. A territorial and legislative analysis of homelessness and social exclusion is followed by the identification of implemented measures required to alleviate these marginal phenomena.

The third part of the paper is devoted to the particularities of homelessness at the level of the urban territorial system represented by Bucharest, Romania's capital-city and one of the largest metropolises in South-East Europe. Homelessness, was a well-developed phenomenon in Bucharest up to the late 1990s, when the first shelters for the homeless where opened (1998), through partnerships between the local authorities and the NGOs. However, the number of homeless in Bucharest tripled between 1996-2010, affecting some 5,000 people (Table 27, p. 115), and becoming a real problem for the local authorities. Children and the youth appear to be the most vulnerable group, mushrooming after 1990 from a few people to 1,270 persons in 2009 (Table 28, p. 117), and including some other marginal phenomena, such as juvenile delinquency, drug abuse, etc., or representing sources of epidemiologic risk.

The Bucharest homeless originate from disadvantaged social environments and from poor areas, especially from the Moldavia region and the South-East of the country. The pauperization of these people was determined by the post-Decembre economic reconversion that generated unemployment. A cartographic representation of the origin of outside areas for the homeless in Bucharest is given in Figure 49 (p. 177).

The immigration of the homeless in Bucharest is demonstrated also by their incidence inside the urban built-up area, with some half of them activating in Victoria Square – Regie – Grozăvești and Eroilor perimeter, with a Gara de Nord Station core (Table 29, p. 118).

Following the general presentation of homelessness in Bucharest, the author individualises this phenomenon within the city area, with focus on the social impact it generates (see the chapter on the perception of homelessness by Bucharest's general population). The interrelation between homelessness and the characteristics of the capital's urban space is discussed in Chapter 10, homelessness being explained in the light of typology and spatialized in relation with the urban space particularities (Table 65, p. 219). The author differentiates several types of habitats for the homeless: green areas (in use or derelict), pedestrian zones, transport infrastructure, commercial and religious areas, heat distribution infrastructure, sewage infrastructure,

residential structures (in use or derelict), residential waste-disposal areas and waste storage areas, vacant structures and brownfields (Fig. 89, p. 220).

The last two chapters of the book are devoted to the territorial management of homelessness. Defining a policy for the territorial management of homelessness started with the assessment of the current process of homelessness management, continued with addressing homelessness from the institutional viewpoint and ended up with analysing territorial management problems and of the objectives of homelessness sustainable management.

As a conclusion of this study, the author says that: "at present, homelessness in Romania is included in a deficient system of management and prevention, being in its first stages of elaboration and development. Attaining the objective of alleviating homelessness and of stabilizing its management, concomitantly conducting a sustainable process of prevention, asks for strong legislative and government financial support in order to implement a long-term policy" (p. 253).

As a whole, the paper has a reliable theoretical support in the substantial bibliography. It can be rightfully considered a reference-work in the contemporary Romanian Geography, being addressed to both specialists and the local authorities, as well as to anyone interested in the issue. The accessible scientific language and the rich illustration make this book a useful tool of research and documentation.

Radu Săgeată