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REVIEW ARTICLES

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SPECIFIC ISSUES OF URBAN SPRAWL IN BULGARIA

1. INTRODUCTION

The issues of urban growth and urban sprawl are both topical and interconnected. Besides, a major aspect of their connection is related to the issues of sustainability. While the growth of the cities is generally considered to be an important positive factor for efficient social and economic development with many implications for urban and environmental sustainability, sprawl is believed to be one of the main threats to sustainable development at the regional and local level.

The growth of the capital cities of the post-socialist countries has added new strokes to this 'growth-versus-sprawl' dilemma as nearly all of these cities had experienced considerable increase in the number of their population during the last couple of decades. Sofia was no exception to this rule – between 2001 and 2011 – in just ten years its population increased by 10.3% (NSI, 2012b). Eventually, it is not strange that many authors were interested in this development and studied the processes of urban growth in the former socialist countries. Most such studies have, generally, observed processes of urban sprawl around many large post-socialist cities and, in particular, around the capital cities of the Central-European countries and those in the Baltic region (Hungary, Latvia, Lithuania, the

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Czech Republic etc.) (Kok and Kovács, 1999; Timar and Varadi, 2001; Tammaru *et al.*, 2004; Sýkora and Novák, 2007 etc.). More or less similar urban processes had been identified in South-eastern Europe, too (Nedovic-Budic and Tsenkova, 2006; Hirt, 2007a). Still, in this part of the continent the issue seems to be less investigated.

The goal of the paper is to examine whether the cities in South-eastern Europe and in Bulgaria, in particular, are facing problems of sprawl of the types already faced in Western and Central Europe. Indeed, local traditions in urban forms do cast some doubts whether Bulgarian cities would follow the sprawling Western model. Urban densities in Bulgaria are typical European, but the urban forms are very compact with clear and distinct city boundaries – similar to the Mediterranean cities (Leontidou, 1990). Distinct city boundaries were a main specific feature of the socialist city, too (Bertaud, 2004; Hirt, 2007a). Nevertheless, Mediterranean cities in Greece, Italy and Spain have already experienced serious problems of sprawl, just like many former socialist cities in Central and Eastern Europe. Yet little research has been carried out on the identification of specific local reasons and features of sprawl in the countries in South-eastern Europe (Hirt, 2007a; Nedovic-Budic *et al.*, 2012; Slaev, 2012b; Slaev *et al.*, 2012). And local specifics are, no doubt, essential for the development of adequate urban policies to combat the negative effects of sprawl and to provide for sustainability.

2. RESEARCH QUESTIONS AND APPROACH

The first goal of this paper is to investigate whether the transition from centralized socialist to democratic market society in Bulgaria has resulted in emergence of processes of urban sprawl. For this purpose the paper will study the structure and the development of the housing stock in the different types of districts in Sofia and will examine the current trends of demographic changes and intra-city migration.

Second, if processes of urban sprawl exist, the research should identify to what extent they follow the Western model and, also, in what specific areas and forms and to what extent they deviate from it. For this purpose the paper will examine the causes and the drivers of changes in suburban areas – i.e. the related housing preferences and other motives of the population of Sofia with respect to the historical background of their formation. Next, the impact of housing preferences on suburban forms will be investigated and the specific features of urban development of the city's outskirts and the surrounding rural territories.

3. URBAN EXPANSION OF SOFIA DURING THE LAST DECADES

This part of the study will examine the urban development of Sofia in order to answer the questions whether the processes on the urban fringe should be identified as a form of sprawl. Since Sofia grew dramatically in the course of the 20th century this growth was inevitably associated with spectacular urban expansion. In 1879 when it was proclaimed a capital its population was only about 20,000, but a century later in 1985 the number of its residents was 60 times larger (NSI, 2012b).

The difference between urban growth and sprawl is usually presented by two alternative graphs of urban expansion depicting the density of occupation in a function of the distance from the city centre. While compact urban growth should retain approximately the same gradient of the density of occupation both in the city's central and peripheral areas, sprawling expansion is relating to an obvious decrease in the gradient. Thus, a suitable model of sprawling urban forms is a cone of sand that with time spills onto the surrounding terrain, as cited by Couch *et al.* (2007). Respectively, the changes of residential and housing densities in central city areas and on the urban fringe may be used as a relevant indicator to assess the type of urban growth in Sofia. So the first factor to be investigated will cover the shares of housing construction that had been attracted by different areas of the city in the course of the 20th century and during the last decades. Then the demographic processes in the central and suburban districts of Bulgarian capital will be examined.

In this analysis the districts of Sofia are classified in four main groups. This grouping in general follows the classification adopted by Hirt (2007a), though with some differences. The first comprised the three administrative districts that occupy the central areas. Nine districts form a kind of ring around the centre – referred to as intermediate districts or historical, meaning that most of their territories were urbanized in the first half of the 20th century. Next five districts occupy the peripheral territories of the city. They were urbanized in the 1960s, 1970s and 1980s. Respectively, their housing stock comprises mainly prefab blocks of flats that formed the typical socialist housing estates. The last group of districts occupies the suburban/ rural areas of the municipality of Sofia. It should be studied in three sub-groups because they vary substantially with regard to their trends of development.

The structure of the housing stock in Sofia is shown in table 1 and is depicted by the diagram in figure 1. Obviously, the largest part of the housing stock of the city as a whole had been built in the 1970s and 1980s and is located in the intermediate and the peripheral districts of the compact urban area. It is also evident that the share of the housing stock in the central districts is decreasing after the 1950s. After World War II and particularly from the 1960s most housing units

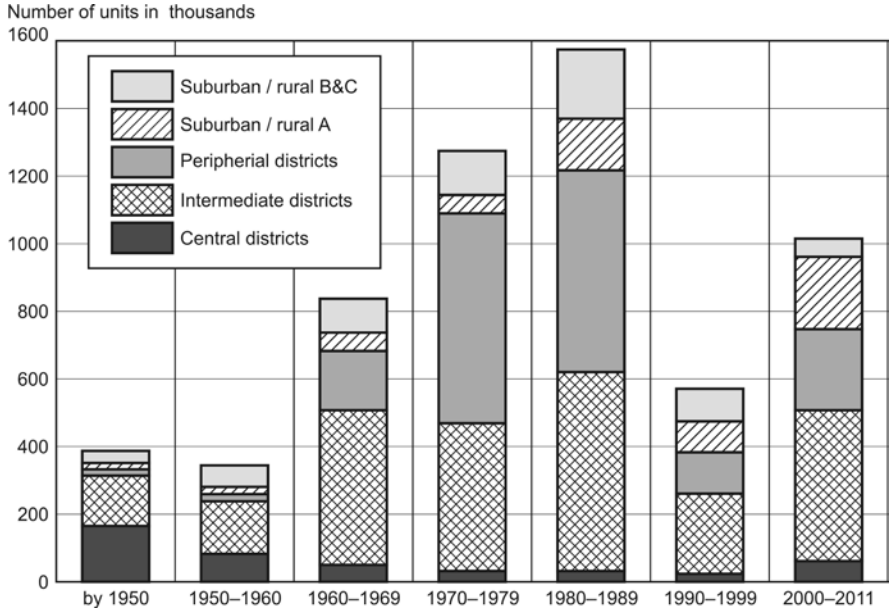

Fig. 1. Housing units in the districts of Sofia by periods of construction

Source: authors' elaboration based on data from NSI (2012a)

were constructed within the intermediate and the peripheral districts – i.e. within the compact city, but outside the central areas. In the 1960s, 1970s and 1980s the intermediate and peripheral districts accounted for 74% to 83% of the housing construction, while since the start of the transition period they accounted for about two thirds (table 1).

Table 1. Percentage of the housing built in different types of districts during each decade after 1970

Types of districts	1970–1979		1980–1989		1990–1999		2000–2011	
Central districts	3,828	3.0%	6,067	3.8%	2,370	4.1%	6,699	6.5%
Intermediate districts	43,972	34.2%	56,748	35.8%	24,323	42.0%	45,302	44.1%
Peripheral districts	62,423	48.5%	59,939	37.8%	12,107	20.9%	23,591	23.0%
Suburban/ rural A	5,547	4.3%	15,746	9.9%	9,622	16.6%	21,564	21.0%
Suburban/ rural B&C	12,841	10.0%	20,080	12.7%	9,494	16.4%	5,467	5.3%
TOTAL	128,611	100.0%	158,580	100.0%	57,916	100.0%	102,623	100.0%

Source: NSI (2012a).

However, examining the rates of construction in the suburban areas of Sofia is most important for this research particularly in comparison with the central districts – see the diagram in figure 2 that illustrates the rates of construction of housing units only in the central and the suburban districts. Again, it indicates the fall of the rates of construction in the central areas during the second half of the 20th century, but parallel to that the rates in the suburban districts had been rising. The total share of the housing construction realized in all suburban/rural areas throughout the 20th century had varied, but it has always been about one fifth (between 14% and 23%). In the 1990s this share increased to 33%, but the next (the last) decade was marked by substantial differences between the districts in the outskirts of Vitosha to the south of Sofia and the districts in the plain to the north of the capital. Figure 2 illustrates two quite different trends in the rates of housing construction in the southern and the northern suburban districts. Until the 1970s the southern suburban territories (referred to in this study as Suburban A) had attracted only about 5% of housing construction in Sofia municipality, while the territories in the plain to the north (i.e. Suburban B) of the city 'traditionally' attracted 10% to 13% (16.4% in the 1990s). Since the start of the 1990s the rates of construction in all suburban areas slowed down similarly to the rates in all Sofia's districts. However, during the first decade of the new century, the rates in

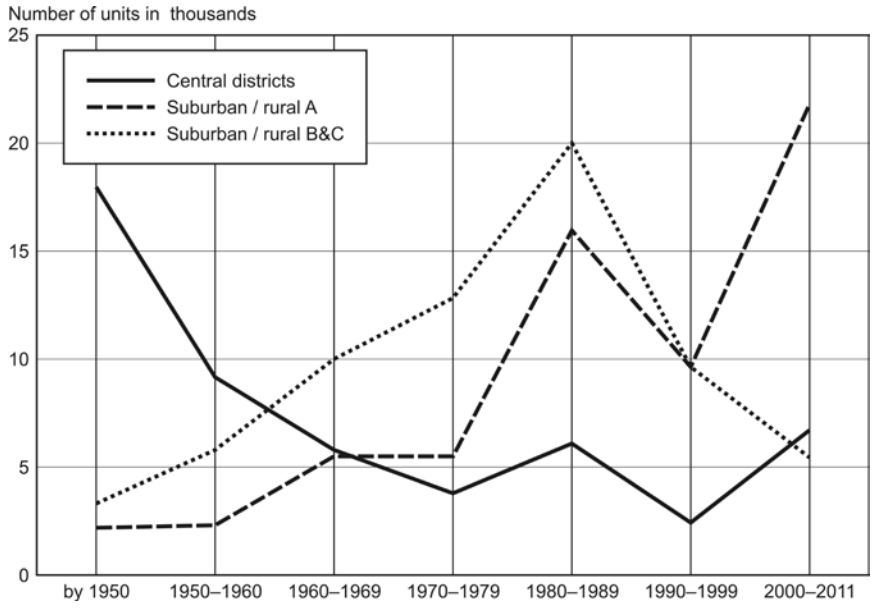

Fig. 2. Housing units in the central and the suburban districts of Sofia by periods of construction

Source: authors' elaboration based on data from NSI (2012a)

the northern suburban districts continued to fall to only 5.3%, while those in the districts to the south of the city accelerated drastically to 21% of the total. Apparently the southern areas were subject to intensive processes of sprawl, while the northern were not.

Demographic data provide stronger evidence of processes of suburbanisation in Sofia. Table 2 displays the size of the population in the different types of districts by periods and respective changes.

Table 2. Percentage change in population levels in the different types of districts of Sofia in the period 1985–2011

Types of districts	1985	1992	Change 1985–1992	2001	Change 1985–2001	2011	Change 1985–2011
Central districts	147,828	116,524	–21.2%	94,651	–36.0%	100,786	–31.8%
Intermediate	502,311	454,425	–9.5%	468,174	–6.8%	512,772	2.1%
Peripheral	362,615	399,651	10.2%	386,989	6.7%	420,826	16.1%
Suburban A	67,352	83,724	24.3%	99,630	47.9%	128,020	90.1%
Suburban B	23,585	23,056	–2.2%	24,342	3.2%	28,586	21.2%
Suburban C	98,028	112,755	15.0%	97,056	–1.0%	100,601	2.6%

Source: NSI (2012b).

The decrease in the population of the central districts by 32% and the simultaneous growth of the population of the suburban districts A by 90% is a direct proof of the decreasing gradient of population densities and obvious trends to suburbanization. At the same time, population of suburban districts C has virtually not changed. Therefore, the conclusion is that the population flows from the city centre are directed to the south to suburban districts A and not to the northern districts of Sofia Municipality.

4. STUDY OF THE HOUSING PREFERENCES OF THE POPULATION OF SOFIA AS THE KEY FACTOR OF URBAN SPRAWL

4.1. Residents' Preferences and Motivations in Various Patterns of Suburbanisation

The nature of suburbanisation is determined by its drivers – the reasons, the preferences and the motives of those who settle in suburban areas. Different reasons and motives generate different types of suburbanisation. The type that

is usually classified first – i.e. the 'classical' form (or, in fact, what is generally meant by sprawl) is typical mainly of the developed countries. It is associated with suburbs with high standard of housing and high level of environment, open spaces, greenery, and landscaping. As a rule, residents from the middle and higher social classes settle in such suburbs (Fielding, 1989; Fishman, 1987; Jackson, 1985). The new inhabitants of this type of suburbs come mainly from the urban core or from other urban areas. In contrast to this pattern, a different type of suburbanisation is typical of the developing countries where the prevalent urban processes are caused by rural-to-urban migration. Migrants are mostly poorer rural residents seeking better sources of livelihood (Korcelli, 1990). A third type of peri-urban growth, according to its driving forces and socio-economic reasons, is the stepwise migration to major urban centres (Hirt, 2007a). A fourth type is generated in result of mass relocations of residents due to political reasons, wars or ethnic tensions. It might be considered a form of suburbanization similar to rural-to-urban migration, because residents' motives in such situations are similar.

While the patterns of urban expansion mentioned above are mostly typical of market societies, such processes were observed in socialist countries, too, though the reasons causing them were rather different. In these states the urbanisation of major peri-urban areas of almost all large cities was caused by large-scale industrialisation associated with rural-to-urban migration (Nikiforov, 2008). Whereas industrialisation was a powerful factor for urban sprawl in capitalist states as well, in socialist states it was a major goal of the socialist policies.

Eventually, it should be noted that the first two types of suburbanisation are most widely spread (Hirt, 2007a). Therefore, the following part of the study has to analyze the processes of urbanisation of territories on the urban fringe and around Sofia with respect to whether sprawl of the typical Western style is observed or whether these processes are caused by rural-to-urban migration. In the first case newcomers to peri-urban areas normally are people of higher-social status, with higher income and, probably – with higher education. Their main motivation is obtaining a higher standard of living in an environment that is closer to nature and in lower densities. Suburbanites typical of the second type of suburbanisation are usually people of other, mainly rural areas of the region or other smaller towns and settlements of the country. Probably, most of them would be of lower social status and in this case the main reason for displacement is expected to be seeking of better job and higher pay. Another important point of research is the analysis of historical experience gained and traditions developed in different stages of development of Bulgarian society as far as this is a crucial factor for the formation of residents' preferences and motivations and, hence, the patterns of urban sprawl.

4.2. Traditions in Sofia Residents' Preferences Regarding Peri-urban Development

The hypothesis of this part of the study is that historical factors in the course of the 20th century have shaped Sofia residents' preferences more in favour of compact urban forms. Though the ideal of owning a single-family house in a quiet location is and has always been appealing to Bulgarians in all historical periods, it should be stressed that this ideal seemed to have greater value in Western societies than in Bulgarian.

Probably one of the first occasions on which differences between Bulgarian and Western attitudes became obvious was the preparation of the first significant Master Plan of Sofia, after six other general plans (Kovachev, 2005). In the process of planning the approach of the leading planner, the German architect Adolf Muesmann, proved to be quite different from the views of the Bulgarian representatives involved with the process of planning – the Mayor's office, the Chief Architect and other municipal officials, the professional guild etc. The position of Bulgarian professionals and the community was highly predetermined by the experienced extreme growth of the capital over the last five decades. From 1880 to 1934 the city grew more than 15 times in population (NSI, 2009) and in size of its urban area (Hirt, 2007b; Hirt and Kovachev, 2006). According to Lampe (1984), at that time Sofia was the fastest growing Balkan capital. A key factor was the accelerated industrial development – the city became the industrial centre of the country with 50% of the entire industrial workforce. It is clear, therefore, that the urban growth in this period was fuelled by rural-to-urban migration. Along with that, thousands of refugees from the Balkan wars settled in Sofia's outskirts. For all these reasons the new suburbs were poor and shabby. Lampe (1984) noted that during this period the city became more and more crowded and polluted (by industrial plants). It is then no wonder that the middle-class and the wealthy citizens of the capital did not aspire to live in single family homes in the periphery and the local government had a critical view on urban growth. Respectively, when the plan was commissioned one of its important tasks was to limit the expansion of the city (Nikiforov, 1982, 2008; Kovachev, 2003a) since it was perceived as already too expanded and the government could not afford to provide infrastructure in newly urbanized areas. On the contrary – Muesmann's views concerning Sofia's peri-urban areas were quite different. His professional perceptions were typical Western and he favoured the single-family home as the best form of dwelling. Even more – the German architect believed that single-family housing reflected the traditional national values – an idea that was in line with the official ideology of Germany at the time. Therefore, Muesmann envisaged city expansion by urbanizing new hinterland in the form of extensive territories with individual homes. However, since such a view, was not popular with the public and city authority. Muesmann

had to revise his plan in important aspects (Hirt, 2007b), but still the planned expansion was probably the main cause for its failure.

Residents' preferences were further shaped in favour of inner urban areas and the associated higher density housing forms during the socialist period. Despite that the two plans adopted during this period envisaged compact development and limited territorial enlargement, Sofia experienced a second, highly accelerated expansion of its urbanized area. Socialist industrialisation was the main factor for the city's rapid growth till the end of the 1980s. For thirty-nine years (from 1946 to 1985) its population has increased by 670,000 residents to reach 1,200,000 people (Nikiforov, 2008). It is clear that such an expansion could not happen within the original boundaries of the city and the main resources used were rural hinterlands. However, in the course of this development a second major factor had its impact – the wide-spread of the prefab construction technology (Kovachev, 2003b). The 'Socialist suburbs' – prefab housing estates, emerged. They, of course, were radically different from those in Western countries. In capitalist states some similarities could be sought with French and Italian peripheral housing estates. The difference is in the much lower quality of East-European residential buildings and landscaping. What is important with respect to housing traditions is the manner such a development affected the residents' preferences. The end result was that despite the desire to settle in the big city or the capital, the residents considered the prefab buildings the lowest class housing. The entire mechanism proved to be a strong incentive for the majority of the residents of large cities and the capital to strengthen their idea for the central city areas as the most attractive to live in.

4.3. Analysis of Residents' Preferences and Motivations Determining the Trends in the Development of City Areas and Intra-urban Migration

In this section the current preferences and motivations of Sofia residents will be examined based on conclusions already drawn with respect to historically formed traditions and preferences and the conclusions made in section 3 regarding the existing trends in demographic development. Also, research in the same area conducted by other authors will be used and compared to the results of research carried out for this study.

The main objective of the analysis of residents' preferences and motivations is to establish the driving forces of the trends of intra-urban migration to the fringe. This can also be formulated in terms of determining the nature of urbanisation processes in the fringe according to the types explained in section 4.1 – Western type, rural-to-urban, or a third, specific type. In accordance with the objectives and scope of this analysis, special attention is to be paid to the research works of Hirt (2006, 2007a, b), which also addressed the southern outskirts of Sofia – Suburban districts Hirt (2007a, p. 757) identified three key characteristics to be

explored for the purpose: '(1) demographic (i.e., who moves to the urban fringe), (2) functional (i.e., how are the centre and the fringe economically linked and where do peri-urban residents work?); and perhaps most notably, (3) locational and motivational (i.e. where did the peri-urban residents come from and why did they move?)'. As a result of collected data and performed analysis of 54 in-depth interviews and a survey with 150 completed questionnaires, Hirt came to the following conclusions. First, demographic characteristics supported the finding that suburbanization was mainly of Western type: 40% of newcomers that participated in the survey had incomes that were around four times Bulgaria's average for 2006. Second, regarding economical links between the centre and the fringe, the survey found that nearly one third of the long-time residents worked either in the same peri-urban area or in a nearby peri-urban area, while for the newcomers this share was less than one tenth. Third, regarding motivations for settlement in the suburbs or continued living in the same area, Hirt found that 68% of the newcomers had moved from internal Sofia regions. Only 8% of the newcomers had moved from elsewhere in the country, which was a strong argument against any hypothesis that suburbanisation might be due to rural-to-urban migration. Motivations for settlement in this area were also characteristic for suburbanisation of type 1. In conclusion, the findings suggested that 'the dominant processes along Sofia's scenic southern edge was Western type urban sprawl' (Hirt, 2007a, p. 775).

In several other studies in a similar socio-economic situation – i.e. in conditions of transition from socialism to a market society – the prevalent characteristics found most frequently by the researchers were very much the same (Sýkora, 1999; Kok and Kovács, 1999). Therefore, the most common findings of the authors are that these trends in post-communist states are similar to those in developed capitalists states, but are realised with some delay due to the specifics of their socio-economic development – primarily, delay due to the socialist period. At the same time, in post-socialist states there are also a number of specific characteristics due to specific geographical and historical factors and, in this case too, mainly to the socialist legacy: the existing housing stock, economic processes, specific demographic trends and migration between urban, rural and mountain regions (Nedovic-Budic, 2001; Blinnikov *et al.*, 2006, Slaev, 2012a).

5. CURRENT SUBURBANISATION TRENDS IN SOFIA IN RESULT OF RESIDENTS' PREFERENCES AND MOTIVATIONS

As noted earlier, research performed for the present study (analysis of the latest data from NSI, new information supplied by Sofia Municipality, the Registry Agency, the Provincial Directorate of Agriculture and an inquiry made among ten

leading real estate agencies) generally confirms the findings of Hirt. At the same time, some of Hirt's findings are further developed, and also some are interpreted in a different way mainly with regard to the significance of local specifics. In fact, Hirt also reported the presence of important specifics of the processes in the Bulgarian capital, such as: considerable deviations from the Western pattern in terms of social 'homogeneity' of suburban areas; specific preferences regarding the prevailing type of housing units and density of development, and the presence of certain characteristics typical of the pattern based on the rural-to-urban migration. However, the present research attaches greater significance to the specifics relating to densities and social integration. By the time when Hirt undertook her research Sofia had experienced only about five or six years of growth after the crisis of the transition (it was not until 2000 that Bulgaria's GDP reached its 1989 level). The urban trends in the capital are now much more obvious and realistic also because the property boom of 2005–2008 had been 'tempered' by five years of stagnation.

First of all, NSI data, statistics for the last decade and, especially the 2011 census results definitely support the findings for the presence of suburbanisation processes. As it was established in section 3 – for twenty-six years the population of Sofia central areas has decreased by 47,000 people or 32%, while the population of the attractive peri-urban areas (Suburban Districts A) has increased by 61,000 people or 90%. However, the statistics for the recent years (NSI 2009, 2012b) and the complementary surveys – the inquiry among real estate agencies and the new data from Sofia Municipality, give grounds to conclude that, as evident and explicit suburbanization may be, it is many times weaker than the similar trends in/around other former socialist capitals – Prague or Riga, for example (Stanilov and Sykora, 2012; Krisjane and Berzins, 2012). In Bulgaria the preferences of most customers (including many affluent buyers) are still towards central areas and the so-called 'wide centre' rather than the city peri-urban areas. The rates of new housing development in the intermediate districts are still accelerating (42% of the total for Sofia in the period 1990–1999 and 44% in 2000–2011) and higher than the rates in the suburban districts particularly if the northern districts are also taken into account (33% of the total for Sofia in the period 1990–1999 and 26.3% in 2000–2011) (see table 1). Especially in the northern districts the rate of suburbanisation should even be assessed as low – since the number of population in these areas is still at the level of 1985 (see table 2).

In order to clarify the residents' preferences and motivations and their impact on urban processes, the findings from the statistics of the recent years and the inquiry among the real estate agencies will be presented in the same order as those from Hirt's works (2007a):

First, with respect to demographic characteristics of newcomers, data from the inquiry among the real estate agencies attach less importance to the high social status. Just under half (45.5%) of the realtors classify high income as a major characteristic of newcomers. About one third (36.4%) of the respondents believe that the typical buyers of peri-urban properties are intellectuals, and slightly more than one sixth (18.2%) put the locals in the group of buyers. An unexpected result is that nearly four-fifths of the realtors put on the second and third place the low-income buyers – results similar to those of a study of the preferences and motivations in suburbanisation processes around Riga (Krisjane and Berzins, 2012). Most likely, the cause for this difference with the study of Hirt is because she analyzed only the settlers in the southern districts, while in the present study the realtors refer to all peri-urban areas, including northern ones, where property prices are twice lower.

The new research has shed more light on a specific feature mentioned by Hirt and, eventually, puts a bigger stress on it – the higher densities and the variety of housing types of Sofia's sprawl. Data from Sofia Municipality show that new multi-family buildings in Vitosha District in the recent years comprise 28.5% of the total number of new residential developments, and according to NSI data, the average number of dwelling units in a multi-family building in the same area during the same period is 13.3. Consequently, dwelling units in multi-family apartment buildings comprise 83.8% of the total number of new units. The larger share of multi-family housing provides for higher residential densities and higher rates of cohabitation between households of different social status.

Finally, regarding functional characteristics: here again data provided by Sofia Municipality demonstrate deviations from the Western pattern. It is about the presence of higher integration of service and industrial activities in Sofia suburbs. Data by the municipality for the surveyed peri-urban areas testify that on average 13.7% of the new building permits are for service functions (for commercial, service and storage activities), and 4.4% – for production facilities. Though with some disparities in the figures, data provided by the Regional Directorate of Agriculture confirms that the trends towards mixing land-uses in these territories are substantial. In suburban districts A and B 19.5% of the former rural lands converted to urban use were allocated for manufacture. Another 21.9% are allocated to commercial and service businesses– offices, retailing and all kinds of services, so that housing occupies the rest 58.6% of the territories. In suburban districts C 51.2% of the former rural lands converted to urban use were allocated to manufacture, 36.1% – to commercial and service businesses and only 12.7% – to housing. It is obvious that the level of the mix of different land-uses is much higher than the level typical for the 'classical' Western type suburbanisation, which is another important local 'contribution' of the Bulgarian model.

6. CONCLUSIONS

The first conclusion is, no doubt, that processes of urban sprawl have emerged in Bulgaria during the last couple of decades and already have changed the suburban patterns in the outskirts of Sofia. This is a simple, but critically important conclusion, because so far Bulgarian planners have underestimated this threat and, even, have failed to identify it. The main reasons for this omission were due to lack of experience with similar problems and, mainly, to specific traditions relating to comparatively high, though typical European densities and compact urban forms. Yet, due to its unplanned nature and scattered forms, sprawl always generates unsustainable urban processes.

All facts and findings of previous studies and the present one confirm the second main conclusion that, undoubtedly, Sofia suburbanisation pattern is of Western type, so it is characterized by a number of associated problems and issues like overconsumption of land, inefficient use of infrastructure and other resources. At the same time, Bulgarian sprawl in many aspects is shaped by local traditions established in the course of centuries and (especially, the 20th century) by the specific historical development – both socio-economic and urban. Sofia's new suburbs are more compact than typical Western suburbs and they are characterized by higher densities and higher levels of social mix and mix of uses.

Eventually, the third main conclusion is that suburbanisation around Sofia and around other big cities in the country is speeding up and, thus, Bulgarian sprawl turns closer to the Western patterns. This means that policy measures are already needed to avoid associated problems, especially in view of the insufficient land resources of Bulgaria. Apparently, all these issues should be subject to thorough and in depth studies as next steps of research in this area in order to elaborate efficient instruments of relevant policies.

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