

Unplanned Settlements, (Un)Expected Problems: 'Green' Solutions for Low Carbon Serbia?

Introduction

The ambiguity of our epoch, with its multiplying networks, constant displacement and overlapping identities, is obviously shaped by the modern way of life and enabled by a 'magic' support of advanced technology. Simultaneously, we are aware that the huge discrepancies that it creates have to be rebalanced and moderated, but somehow the issues of energy, pollution and sustainability mainly remain in the domain of general strategies, local initiatives, comprehensive guidelines, (anti)utopian visions and predictions. However, cities, through their reinvented/adjusted/modified logic, structure, architecture, energy production and consumption not only manifest recent environmental changes, speculations and trends, but also deliberately or accidentally uncover our ego- and eco-frustrations, doubts and conflicts.

Planning low carbon urban entities and communities is not an easy task and nowadays we could identify three main groups of urban actions marked by the 'green' label. The first group provides the visions and (partial) realizations of new 21st century cities (for ex. high-tech eco-cities Dongtan and Masdar) reflecting the political and financial power of its creators. The second group is focused on numerous urban (re)development projects - from large-scale projects such as The Cool Island Projects in Tokyo, to small-scale interventions like San Rafael Upgrade project in Sao Paulo or CicloRutas in Bogota. Their scope and actual effects depend on various elements - from detected local problems, available resources to the creativity of involved actors and their interaction. Finally, the third group consists of numerous global and local initiatives (for ex. C40 Cities, Transition Towns) which should facilitate energy transition, but also support and promote successful ideas and models.

Obviously, the new ecological imperatives have been accepted as a necessary part of contemporary urban interventions, but the effects of generated planning strategies and low carbon scenarios still have to be evaluated and verified. Macro and micro-scale limitations, obstacles and potential activators that usually direct a development path also condition the pace of transformation and energy transition. Therefore, the case of Serbia and its capital Belgrade will present a complex relation between consequences of the previous and current political and economic situation, ecological problems caused by illegal and unplanned urbanization and possible methods and solutions that could improve the quality of life and decrease CO₂ emission.

Facing the legacy

During the last decade of the 20th century, Serbia and its capital, the city of Belgrade, were highly isolated at the European scene. Numerous problems and social confrontations, as well as the confusion between the pre-existing urban environment, previous governing system and transition process influenced its slow development and delayed process of European integration. However, after several political changes, a new phase of comprehensive transformations has started and the Belgrade metropolitan region, as one of the key-elements of the country's development axis, has faced challenges of modernization and (un)controlled expansion. Having a distinctive status in the country, it encompasses

approximately 3,222 km² or 3.6% of the Serbian territory which only confirms a sharp division between the capital and the rest of the country. This trend has started after the World War II and between the years 1948 and 2000 the number of inhabitants in the Belgrade metropolitan region has grown over 2.5 times (from 634,000 to 1,618,000). The share of the Belgrade population in the total population of Central Serbia increased (from 15.3% in 1948 to 28.3% in 2002), i.e. in the same period its share grew from 10.9% to 20.9% of the total population of the Republic of Serbia.

The development of the Belgrade metropolitan region has mostly been a product of centralised power at the state level, but the noticeable imbalance has also been the result of uneven national development, as well as a consequence of wrong decisions and complex socio-economic conditions. For example, the majority of investments have been directed to Belgrade, which has led to the stagnation of other Serbian cities and areas. The influx of people reached its peak between 1970s and 1990s when Belgrade gained approximately 15.000 inhabitants every year. Additionally, during the 1990s Belgrade also absorbed a considerable wave of immigrating population, including the war refugees from the former Yugoslav republics and internally displaced people from Kosovo and Metohija who looked for a new permanent residency. This situation has generated serious problems for the increasing population, triggering a spontaneous and uncontrolled development of city-edge settlements, usually without an adequate infrastructure. The traffic congestion with insufficient public transportation connections to other parts of the city has become an unpleasant reality which, finally, caused higher costs of urbanisation.

The legacy of the 1990s and the current urban transformations both influence the level and the structure of CO₂ emission. However, available data can provide only a partial picture of the existing problems, which are nowadays mostly caused by the scale and (dis)position of numerous unplanned settlements. For example, according to the data from 2000, about 30% of all CO₂ emissions in Serbia were connected to the building stock, while 29.15 millions of tonnes originated from solid fuels, 7.9 millions of tonnes from liquid fuels and one million from cement manufacturing. In 2004, the total CO₂ emission for Serbia was 56.7 millions of tonnes. Simultaneously, the residential CO₂ emission per capita was 242.5 kg CO₂ per person.

Year	Value	GDP
2004	5.2 t of CO ₂ /capita	3177 \$ /capita
2003	4.75 t of CO ₂ /capita	2630 \$ /capita
2002	4.34 t of CO ₂ /capita	2014 \$ /capita
2001	3.93 t of CO ₂ /capita	1530 \$ /capita
1997	4.70 t of CO ₂ /capita	2110 \$ /capita

Table 1. Serbia - CO₂ emissions 1997 and 2001 - 2004: values per capita vs. GDP
(Source: U.S. DOE)

The data for the period from 2001 to 2004 illustrate that the increase of GDP was also followed by the increase of CO₂ emissions. Also, when compared with the values from 1997, it becomes obvious that the lowest values were measured in 2000/2001 (after political changes and economic isolation) when the consequences of a decade-long isolation and a decrease in industrial production were highly noticeable. Certainly, the gradual economic recovery has caused changes in this field as well, which - together with the intensified traffic and accumulated problems of illegal settlements - resulted in higher CO₂ emission.

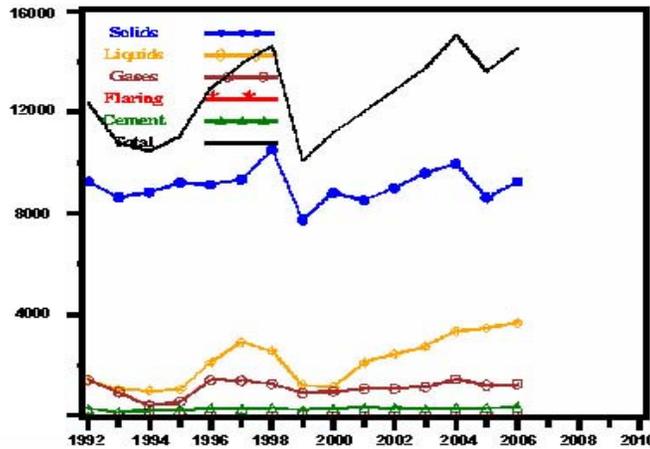


Figure 1. Yugoslavia/Serbia&Montenegro/Serbia - CO2 Emissions 1992-2006 (in thousand metric tons of carbon)

(Marland, G., Boden T.A., Andres R.J. (2000) "Global, Regional and National CO2 Emission" in Trends: A Compendium of Data on Global Change, Oak Ridge, Tenn., USA: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, US Department of Energy)

At the same time, the structure and sources of CO2 emissions have not drastically changed since 1998. Consequently, public electricity and heat production, as well as manufacturing industries, construction and transportation still represent the main sectors that generate the highest pollution.

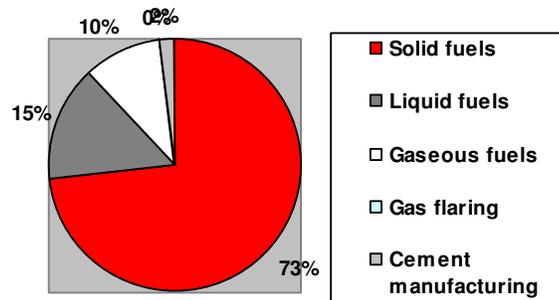


Figure 2. CO2 emissions by source (Serbia and Montenegro, 1998)
(EarthTrends 2003, Country Profiles, <http://earthtrends.wri.org>)

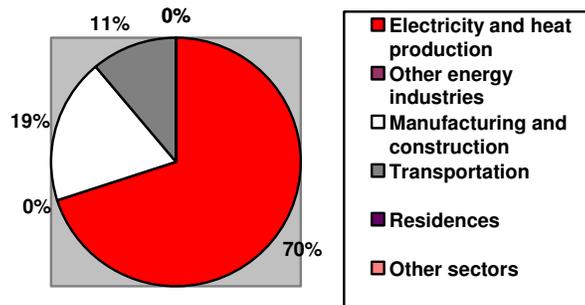


Figure 3. CO2 emissions by sector (Serbia and Montenegro, 1999)
(EarthTrends 2003, Country Profiles, <http://earthtrends.wri.org>)

The problem(s) of illegal settlements

The term 'illegal construction' represents an illegal action, i.e. a practice outside a legal system and its institutions. Usually, it means that there has been a breach of regulations building a house without a construction permit, most often for the purpose of satisfying the housing needs of the family. Certainly, there are some other forms of illegal construction (such as a construction of country houses or even business premises) but they are not the subject of this paper.

Illegal construction could be undertaken for different reasons. Besides the basic reason, i.e. impossibility to gain the right to individual housing construction legally due to certain complex omissions of the social system of the country, it could serve to ensure a faster, cheaper and more liberal construction to those undertaking it. Illegal construction also helps them to avoid the time consuming and complicated procedure of obtaining numerous approvals, licences and certificates as well as to avoid paying taxes for utilities and by-pass all those administrative rules in regard to basic characteristics of the object itself.

During the last two decades, the illegal construction in Serbia and Belgrade has reached large numbers. However, exact data and reliable sources on the number of illegally constructed objects and of the people dwelling in them do not exist. It is, however, possible on the basis of some findings to make an estimation of the scope of this process that will, at least partially, give us a notion of the extent of this occurrence in our country. For example, in Serbia in 2003 there were 400,000 applications for the legalization of already built houses, while in 1996 only Belgrade had around 76,700 illegal buildings (approximately 5,130,000m²) from which 33,600 were aimed for housing (approx. 3,780,000m²). The inner city area had 22,691 illegal residential buildings, 1,376 illegal holiday houses and 32,731 illegal service buildings (in total 56,798).

According to the findings from 1995, only 20% of the buildings in the peripheral areas were actually planned and/or regulated by some spatial plan, and only 35% of them had some kind of technical documentation. As a result, most of the settlements on the periphery do not have a basic infrastructure - around 90% of housing units (flats) have electricity, 65% are connected to the public water system, around 20% are connected to the sewage disposal system and only 5% have distant heating. The urban lots were, in most cases, created spontaneously and therefore their size could vary from 500m² (around 20%), 500-1,200m² (50%) to more than 1,200m² (30%).

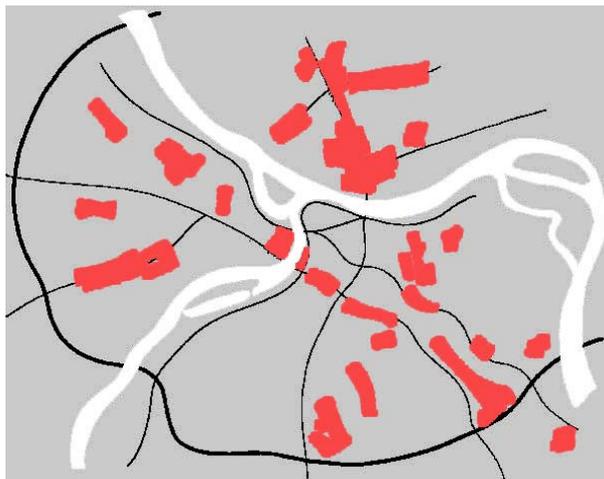


Figure 4. Belgrade - the position of areas with unplanned and illegal construction.

Spontaneous and illegal housing construction was seriously registered by mid seventies of the 20th century in all parts of ex-Yugoslavia, especially in bigger towns and cities. At that time, this occurrence was observed not as a serious consequence of an imbalanced housing system but primarily as criminal behaviour of certain individuals. By the end of the 1980s, some 23 locations with over 9,000 illegally constructed housing objects were registered in Belgrade's ten municipalities. In 1993, after privatization of the social housing fund, flats became private property of individuals or households and they ceased to be a social concern. This privatization took place simultaneously with disappearance of ex-Yugoslavia, which, on the other hand, brought some 250,000 refugees from the ex-Yugoslav republics into Serbia and Belgrade. The non-existence of a housing policy adequate to deal with this influx of inhabitants, as well as the lack of funds required for investments in the housing construction resulted in a number of families without a place to live. Therefore, a part of these families started building their houses without construction permits.



Figure 5. Kaludjerica - the largest illegal settlement on the outskirts of Belgrade

In 1994, it was estimated that there were some 35,000 to 40,000 illegally built houses for about 100,000 inhabitants. A year later, the so-called 'legalization law' was passed with the intention to stop further illegal construction, but this problem still remained unsolved. Today, the estimations are that in ten Belgrade's municipalities there are more 200,000 illegally constructed objects. Even though these objects differ in their locations, agglomeration, construction, purpose and other characteristics, it is certain that illegal construction has become one of dominating forms of solving housing problems (in the 1990s) which additionally complicated numerous environmental, legal and social issues.

Causes and effects

The reasons for the illegal construction in Serbia and especially its capital Belgrade, are numerous, but the most important are:

- lack of coordination between plans and actual needs and possibilities of (new) inhabitants,
- poor information exchange,
- inefficient control,
- very complicated procedures of obtaining construction permits.

Simultaneously, decrease in social housing construction (from 12,500 flats per year in social sector in 1979 to 500-700 flats during the 1990s), as well as a strengthening of private initiative, even worsened the situation. Evidently, the drastic change of socio-economic and political systems was followed by a degrading of moral principles and a decay of values causing a shift of behaviour in urban surroundings.

The most recent researches recognize more reasons for illegal construction in Serbia. Beside the obvious imbalance of urban and economic development and a high level of migration, they also emphasize the problem of inadequate housing and land policies and the

previous orientation to collective social housing (which favoured social ownership while discriminating private ownership and individual housing construction). At the same time, the people employed in social sector had unequal conditions for housing programmes and the crediting systems for housing construction were under-developed. The situation was additionally complicated by ineffective legislation, inadequate plans and their inefficient implementation. However, since the majority of Serbian population had serious economic problems during the international isolation of our country, illegal construction became an informal social 'program' which was tolerated (and even indirectly generated) by the political elite.

The consequences of this process are numerous - high-quality agricultural land in the semi-peripheral and peripheral urban belt was occupied without any permission while environmental values and resources were degraded, often completely destroyed or polluted. The environment was also visually and functionally degraded (even in the historical parts of cities) by unplanned, unregulated and unfinished buildings and construction sites. The areas of public interest (infrastructural and transportation corridors, squares and streets) were in danger of unplanned construction and some parts of traffic networks remained without proper regulation, with insufficient dimensions and capacity. Furthermore, a large number of unhygienic and unconditional settlements appeared lacking elementary utility equipment and necessary social infrastructure (schools, health protection, etc.). Unfortunately, a subsequent instalment of utility equipment is rather difficult and expensive, especially bearing in mind that some of the unplanned settlements were constructed on geologically unstable and imperilled terrains. Finally, a large number of incomplete objects still cause a considerable and unnecessary energy consumption which additionally complicates the environmental ballance.

We can notice all these problems in Belgrade as well, but they are magnified and combined with contemporary ecological problems, which are generated from the dynamic processes of urban sprawl, development and transformation. Obviously, a huge conflict between the urban and rural way of life has occurred, preventing the adequate development of transportation and communal networks, causing a negative impact on living environment and - directly and indirectly - increasing the level of CO₂ emission.

Towards an acceptable solution?

Nowadays, the illegal construction in Serbia represents a very ambiguous and chaotic urban category because current regulation instruments and control do not seem to be sufficient. The official solutions for accumulated problems could be found in numerous planning documents and strategies (master plans, regulation plans), but the process of legalization, as well as the mechanisms of state intervention (for ex. credits for reconstruction) are also applied.

The controversial process of legalization is conducted by municipalities. Certainly, there are numerous reasons for its implementation - from economic (budget issues - taxation, revenues, etc.), legal (ownership status, credit possibilities) and social (minimization of conflicts, social security) to ecological (improvement of hygienic standards, reduction of environmental pollution - especially CO₂ emission). However, even though it could solve some problems and partially regulate and improve inherited condition, it is still unclear what additional (and not so positive) effects it can cause in the long run.

The master plan of Belgrade 2021 also underlines the problem of illegal construction and includes several objectives and measures, which should be able to tackle this sensitive issue. Some of them are more general and they encourage efficient management and optimal usage of Belgrade's potential for public benefits and coordinated general and individual interests. At the same time, the plan emphasizes the idea that the existing tissue should be completed with limited linear expansion, while the improvement of the existing networks, technical, communal and transportation systems represents a necessity for the future protection of environment, employment, education and public health.

This set of objectives is also related to the economic, social and environmental improvement of poor and illegal settlements, their (re)arrangement and transformation - without compromising the public interest. According to the plan, these settlements should be urbanized, remediate, legalized and integrated into the city tissue, while an important role is given to various institutions - secretariats, the City Planning Agency and Agency for Urbanization that should prepare adequate procedures for quicker responses to investors' requests. The importance of an efficient combination of market and planning measures and instruments is stressed instructing a new, socially acceptable city planning parameters and standards for market-oriented housing construction, socially financed flats and remediation of non-hygienic settlements.

Limitations, difficulties and challenges

The sensitive problem of unplanned and illegal settlements in Serbia and Belgrade, as its major urban node, obviously needs a comprehensive and multidisciplinary approach. Therefore, the improvement of environmental conditions and the idea about its 'low carbon' label definitely look like a utopian concept, especially considering the main identified obstacles (Ristic, 2006):

- lack of national housing strategy,
- inadequate political support for long-term solutions,
- lack of suitable financial mechanisms which would support housing investments, additional infrastructural networking and improvement of illegal settlements,
- inadequate and outdated legal framework,
- uncoordinated and inappropriate land policies and planning concept on local level,
- weak institutional support on local level,
- inherited collective attitude that the individual housing construction could be 'beyond the law' i.e. unregulated.

Consequently, the regulation and control of unplanned construction could face a number of problems and questions such as:

- how to define criteria for demolition or reconstruction of already existing buildings and streets/roads,
- how to select the most suitable concept for these actions - considering the type, context and/or local conditions,
- how to synchronize methodology, efficiency, costs and effects of administrative bodies and institutions which should enable implementation of plans and prevent further illegal construction (Milic, Petovar, Colic, 2004).

However, we should be aware that even small, but well integrated interventions and initiatives could stimulate actions that gradually change the whole image of these neglected and chaotic urban areas. The first step should definitely be a renovation of existing buildings and improvement of their thermal insulation. Furthermore, the capacity of inadequate street networks should be adjusted to the current situation and new number of inhabitants which means that public transportation needs to be modernized and intensified. The next step could take these urban areas towards some new solutions - stimulating water and waste recycling, promoting alternative energy resources and supporting creative and 'clean' ideas which could prevent and/or decrease unnecessary emission of CO₂.

Fortunately, the expensive clean-tech solutions are not the only possible way of urban eco-renewal. Instead, the continuous education of all involved groups and the introduction of a forgotten environmental consciousness could open a new phase for Serbia.

Conclusion

The reasons for building unplanned settlements are numerous and complex and in Serbia this process was intensified during the 1990s when a large number of refugees and displaced persons from ex-Yugoslav republics accelerated it even more. Types and forms of illegal construction are various, but the most common are those done by the poorer classes trying to solve their housing problem. Unfortunately, the price for this kind of unregulated solutions is very high for the whole city - the consequences are non-hygienic, inadequately equipped settlements that distort the identity and quality of urban environment on many levels and scales - from functional and social to ecological, from local to regional.

Considering the current status of Serbia, as well as the aspirations of its capital, the city of Belgrade, the general development, guided by new 'eco' imperatives, is based on the actual comparative advantages. They should improve the quality of physical structure and environment as well as to identify, affirm and improve specific elements of identity which is drastically destabilized by a number of illegal buildings and settlements. Some parts of the Master plan of Belgrade 2021 indicate possible solutions of this problem but the real action still needs some further elaboration.

Serbia, as many other countries with similar social, economic and ecological problems, is planning to open a new chapter of energy transition, to materialize concept of sustainability and raise ecological consciousness. Officially, it has ratified Vienna Convention in 1992 and the United Nations Framework Convention of Climate Change (UNFCCC) in 2001 and its energy policy emphasizes the importance of renewable energy sources, rational use of energy, energy efficiency and various measures for investments into energy sector and its development. Unfortunately, in spite of these intentions directed by EU strategies, the situation is still difficult. Some damage is already done and old habits cannot simply be erased. Therefore, it is very questionable what solutions and concepts would be efficient, sustainable, affordable, renewable, user/environmentally-friendly and, above all, ethical in our 'reinvented' perception of energy transition and 'low carbon' fashion.

However, maybe being 'green' and 'low carbon' will not remain just a matter of political promotion and propaganda. Hopefully, it could evolve into a state of mind and the result of these changed priorities could inspire actions which we all expect - but still do not practice.

Aleksandra Djukic, Faculty of Architecture University of Belgrade, Serbia
Aleksandra Stupar, Faculty of Architecture University of Belgrade, Serbia

References

- Agency for Informatics and Statistics of Belgrade (2003) *Population of Belgrade according to the census from 2002*, Belgrade
- Agency for Urbanization of Belgrade (1995) *Information on illegal construction on the territory of Belgrade*, Belgrade: Agency for Urbanization of Belgrade
- Agency for Urbanization of Belgrade (1996) *Illegal Construction on the Territory of Belgrade*, Belgrade: Agency for Urbanization of Belgrade
- Djukic, Aleksandra, Milovanovic, Danijela (2002) *Unplanned Settlements versus Viability: Yugoslav Practice*, UPE 5, Oxford Brooks - conference proceedings [cd]

- "Land Use, Land-Use Change, and Forestry" (2001) *Special Report of the Intergovernmental Panel on Climate Change*, Geneva: Cambridge University Press for the Intergovernmental Panel on Climate Change
- Laws on planning and arrangement of the space and settlements, *Official Journal of the Republic of Serbia*, 44/95
- Macura, Vladimir (1997) *Poor Areas of Belgrade*, Belgrade: IAUS
- Marland, G., Boden T.A., Andres R.J. (2000) "Global, Regional and National CO2 Emissions" in *Trends: A Compendium of Data on Global Change*, Oak Ridge, Tenn., USA: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, US Department of Energy
- Milić, A., Petovar, K., Čolić, R. (2004) "Bespravna izgradnja u Srbiji: geneza i perspektive rešavanja problema" in *Stateški okvir za održivi razvoj Srbije*, Beograd: IAUS, p. 253-261
- EarthTrends 2003, Country Profiles, <http://earthtrends.wri.org> [2 July 2009]
- Nikezic, Zoran, Petovar, Ksenija, Vujosevic, Miodrag, Spasic, Nenad (1999) "General Plan of a Viable Development of Belgrade – a Framework of a New Approach", *Architecture in City Planning*, Volume 6, p. 5-19
- Petovar, Ksenija (1992) "Illegal construction and grey economy – one parallel", *Sociology*, Volume 4, p. 525-538
- Pusic, Ljubinko (2001) *Održivi grad: ka jednoj sociologiji okruženja*, Beograd: Nezavisna izdanja Sl. Masica
- Ristić, Svetlana (2006) "Stambeni sektor u Republici Srbiji" in *Polazišta za formiranje nove stambene politike Republike Srbije*, National Housing Conference: Towards a New National Housing Policy for Serbia, Beograd: Ministarstvo za kapitalne investicije, p. 11-17
- Stojkov, Borislav, ed. (1997) *Obnova gradova u Srbiji*, Beograd: IAUS
- Towards More Sustainable Urban Land Use: Advice to the European Commission for Policy and Action* (2001), EU, http://ec.europa.eu/environment/urban/policy_initiatives.htm [2 July 2009]
- Urbanistički zavod Beograda (2003) *Generalni plan Beograda 2021*, Beograd: Urbanistički zavod Beograda
- WHO (1999) *Towns & European Sustainable Cities Campaign*, Copenhagen: WHO
- Zekovic, Slavka (1999) "Elements and Forms of Planned Reconstruction of Belgrade", *Architecture in City Planning*, volume 6, p. 27-34