

Strategies for Sustainable Cities: Climate Change as a Generator of Development Planning Policies - Belgrade Example

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1 ABSTRACT

This paper considers the impact of climate change on sustainable development of cities and compares the links between the developed countries strategies and the strategy in Serbia. The results of this comparison may be used as guidelines of the future planning process in Serbia.

The paper briefly presents sustainable development concepts in Sweden, the Netherlands and Germany and show that climate change is crucial for sustainable development strategies and new planning policy of these European countries. Then, the paper considers the current sustainable development in Serbia and, particularly, Belgrade city expansion to suburban areas. Finally, the paper explores possibilities of foreign experience application to Serbia planning policies improvements.

2 INTRODUCTION: CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

The model of sustainable development links the needs of today's generations with the life prospects of future generations and demands that long-term development is designed in a manner which is fair to both. It promotes a dynamic economy, social and territorial cohesion and environmental protection in a peaceful and secure world.

Climate change is one of the greatest challenges facing the world. This issue requires global cooperation, participation of many segments of society and of both producers and consumers. Efforts to slow down and mitigate the effects of climate change will cause enormous costs. But the price of not taking any action is likely to be much higher. In recent years this issue has become a central concern for both, the general public as well as decision makers, owing to frequently occurring extreme weather events and their consequences on the environment, society and regional and local economy (European Communities, 2004; RMNO, 2007).

Adapting spatial planning to climate change has a great potential. It will enhance the quality of land use and make it sustainable. Spatial planning mediates between competing demands on the way land is managed and used. With climate change underway and future change unavoidable, all professional advice and political decisions must now take climate change into account. We need to start today adapting to these changing conditions, to ensure our social, economic and environmental prosperity (ESPACE project, 2008).

3 DEVELOPED COUNTRIES: SUSTAINABLE DEVELOPMENT STRATEGY

The sustainable development concepts of the developed countries are analyzed in the following. The sustainable development strategies of Sweden, the Netherlands and Germany are discussed (European Communities, 2004). A long environmental policy tradition exists in these countries. However, due to the meaning of sustainable development in local context, each country's definition differs according to its culture and society. The analysis aim is to present the focus of these European countries while formulating their own strategies. In this way one can reveal the importance of climate change impact on new planning policy. The mentioned countries have formed general principles of sustainable development on the World summit on sustainable development held in Johannesburg 2002, the EU strategy for sustainable development and the Lisbon strategy (SME, 2004; RMNO, 2007; FGG, 2002).

3.1 Sweden

The main issues of sustainable development in Sweden are analyzed on the basis of the National strategy for sustainable development (2002) and the revised version of this document named A Swedish strategy for sustainable development - economic, social and environmental (2004), both prepared by the Ministry of Environment. The priority of these strategies is the integration of social, economic and environmental dimensions of the sustainable development. It also defines the long term vision, as well as instruments, mechanisms and processes that are necessary to implement the changes. The advantage of the strategy is

reflected in the precisely defined objectives and measures for the achievement of sustainable development (SME, 2002, 2004).

The most important topics of sustainable development are presented in eight core areas: (1) the future environment, (2) limitation of climate change, (3) population and public health, (4) social cohesion, welfare and security, (5) employment and learning in a knowledge society, (6) sustainable economic growth and competitiveness, (7) regional development and regional conditions, (8) development of sustainable community planning (SME, 2004, p.3).

Concerning climate change, the previous strategies main objective refers to achieving balance of greenhouse gas concentration in atmosphere. Particularly, greenhouse gas emissions in the period 2008-2012 have to be at least 4% lower than the values of these gases in 1990. This objective can be achieved by the following measures (SME 2002, p.22):

- distribution of information in order to raise public awareness of climate change
- tax changing in terms of increasing taxes for activities that lead to high emissions of greenhouse gas
- promotion of alternative fuels in the transport sector
- promotion of renewable sources electricity use.

Attention is drawn to the active participation of all community members who have an interest in reducing the climate-changing gases. Thus, the landlords of state-owned real estate are instructed about reducing fossil fuels use. Also, the Government has set up a car industry cooperation program with the aim of developing environmentally reliable technology for the cars of the future. A significant contribution to reducing the impact on the climate change is reflected in the change of production technology, as well as the use of final products (SME, 2002, p.22).

Particularly, the strategy highlights the importance of planning as an instrument for the implementation of the sustainable development priorities. In this sense, integrated approach adoption is important and not focusing to physical environment only. Different interests regarding installation, infrastructure and superstructure must be balanced, which is achieved by planning a healthy environment for future generations (SME, 2002, p.11). Efforts to improve the indoor environment and promote higher quality building design, construction and maintenance standards are to continue. Also, town and country planning must be further developed and brought into line with sustainable development policy goals (SME, 2004, p.19).

3.2 The Netherlands

Analysis of the sustainable development of the Netherlands is presented in the document entitled A New sustainable development strategy: An opportunity not to be missed, which is a report of the peer review of the National sustainable development strategy (RMNO, 2007). The national strategy was written as an Action programme for sustainable development in 2003, named Sustainable action and published by the Ministry of housing, spatial planning and the environment (RMNO, 2007, p. 53).

The main sustainability topics, according to Sustainable action, were: water, energy, health, agriculture and biodiversity - known as the WEHAB themes (Ministry VROM, 2003, p.10). The focus of the mentioned programme is dominantly environmental, but the social dimension and economic sustainability are missing. So, it can be said: "It is not a sustainable development strategy" (RMNO, 2007, p.14). A New sustainable development strategy (NSDS) repairs the disadvantages of the action plan suggesting the Government to take the opportunity, in partnership with society and all relevant stakeholders, to develop such a NSDS, which should not be just an internal Government's action plan (RMNO, 2007, p.15). The main topics, beside the WEHAB themes, are: demographic developments, mobility, sustainable production and consumption, and knowledge-based economy (RMNO, 2007, p.46).

As can be seen in the previous paragraph, climate change as a separate topic is not discussed in any document on sustainable development of the Netherlands. However, within the national sustainable development strategy, the mentioned issue is analyzed through the themes of energy and mobility. The fundamental goal includes the need to ensure supply in the long term and the need to reduce drastically emissions of greenhouse gasses. Specifically, the Netherlands should reduce greenhouse gas emissions for

6% during the first Kyoto budget period (2008-2012) as compared to the base year (1990). To achieve this goal, the sustainable development strategy lists the following measures (RMNO, 2007, pp.62-67):

- greenhouse gas emission reduction has to be achieved through technology leaps
- TV and radio commercials are used to influence public opinion on saving energy and climate change
- discussion on climate-neutral nuclear energy is revived
- reduction of gas emissions by one-third in 2050 by using multi-fuel cars and hydrogen buses.

A special segment of the sustainable development strategy is dedicated to the introduction of new planning policies for sustainable neighborhood and city development. There are several successful examples of ecologically sustainable cities, i.e. cities that have adapted their planning policy to the climate change-reducing requirements. Typical elements of these plans include environmental quality of public spaces, e.g. cleaning-up waste, curbing air quality hot spots, developing green areas, abating noise of traffic (road and rail) and similar measures (RMNO, 2007, p.85). It is also concluded that expanding beyond city perimeters led to increased pressure on scarce open space, as well to competition with other functional claims (like ecological network, infrastructure, recreational facilities, water retaining as a part of river basin flood management) (RMNO, 2007, p.84). This is the reason why the concept of 'compact city' is popular again. Sustainable construction became an issue within the environmental community as well. The mandatory energy performance standard allowed the government to set a quantitative requirement, beneficial to local climate change policy as well as the energy bill of new house-owners (RMNO, 2007, p.83).

3.3 Germany

Germany is an international frontrunner in environmental policy. This is the reason why there are many documents considering the mentioned topic. The relevant paper that considers the national sustainable development strategy is Perspectives for Germany: Our strategy for a sustainable development edited in 2002, by the Federal Government of Germany.

German strategy sets out the following broad priority areas: (1) efficient use of energy - effect protection of climate, (2) safeguarding mobility - taking care of the environment, (3) healthy (food) production - healthy eating, (4) structuring demographic change, (5) changing old structures - developing new ideas, (6) innovative businesses - successful economy, (7) reducing the demands on land, (8) assuming a global responsibility (FGG, 2002).

The Federal Government has developed in detail general concept, goals and measures to be taken for the first three of the priority areas for action. The main goal is reducing the greenhouse gases specified in the Kyoto Protocol (CO₂, CH₄, N₂O, PFCs, CFCs, SF₆) by 21% (for levels during the period 2008 to 2012 as against levels in 1990). By 2000 a reduction of over 18% had already been achieved (FGG, 2002, p.141). The programme contains many measures, such as (FGG, 2002, p.162):

- ecological taxation reform
- climate protection agreement with industry
- agreement on the maintenance, modernization and development of heat-power cogeneration
- proposal of renewable energies
- market introduction programme for renewable forms of energy
- 100,000-roof programme for photovoltaics
- energy saving regulation
- programme to promote CO₂-reducing measures in housing stock
- tax for lorries using autobahns, based on mileage and emissions, starting from 2003
- setting up German energy agency.

The last segment of the strategy is dedicated to the land as the complex structure of ecological, economic and social requirements. A sustainable form of developing the urban structure is quantitatively and qualitatively controlled. The quantitative approach relates to land recycling, to more extensive mixed use and to traffic-

saving residential designs with residential development concentrated at nodal transport points and along transport axes. In the qualitative way, the living environment and the recreational value of open space in inner cities must be improved (FGG, 2002, pp.287-291). There are several measures to achieve this (FGG, 2002, p. 162):

- conserving open space
- controlling residential development at the interface between town and country
- intensifying the development within town and city areas.

Those instruments are postulates in many regional planning concepts under the title 'development inside before development outside'. It means finding new space for housing and commercial uses in the first instance in the existing town and city areas, and not giving a further boost to the process of suburbanisation by comprehensive new build measures on a greenfield site (FGG, 2002, p.296). Also, the particular attention is focused on the 'ecological footprint', which measures human use of the environment in terms of space requirement per inhabitant (FGG, 2002, p.299).

4 SERBIA: SUSTAINABLE DEVELOPMENT STRATEGY

4.1 Serbia

The National sustainable development strategy is adopted in 2008 by the Government of the Republic of Serbia. The document is based on EU documents: the EU sustainable development strategy (adopted in 2001 and reviewed in 2006), and the Lisbon strategy (adopted by the Council of Europe in March 2000). Serbian strategy is harmonized with the UN millennium development goals and the National millennium development goals for Serbia as adopted by the government of the Republic of Serbia in 2006. The prospects for the achievement of sustainable development in Serbia lie in the introduction, adjustment and implementation of the previously mentioned EU documents' principles (Government of the Republic of Serbia, 2008).

The key national priorities which will contribute most to achieving the vision for 2017 are the following: (1) EU membership, (2) development of a competitive market economy and balanced economic growth, (3) development of human resources, increased employment and social inclusion, (4) development of infrastructure and balanced regional development, (5) protection and promotion of the environment and achievement of rational use of natural resources (GRS, 2008, pp.14-16).

However, the climate change topic is not considered explicitly. The possibilities for the mitigation of climate change are taken into account within the last national priority. The main objective is protection and promotion of the environment, preservation and enhancement of environmental protection system and use of natural resources to ensuring their availability for the future generations, which requires (GRS, 2008, p. 16):

- establishing a system of protection and sustainable use of natural values or resources (air, water, mineral resources, forests, fish, wild flora and fauna)
- strengthening the inter-relations and achieving the significant effects between environmental protection and economic growth, integrating environmental policy in other sector development policies
- investing in reduced pollution of the environment and development of cleaner technologies
- reducing the high energy intensiveness of the Serbian economy and providing for a more efficient use of fossil fuels
- promoting the use of renewable energy sources
- planning sustainable production and consumption and reducing waste generation by unit of product
- protection and preservation of biodiversity.

It is interesting to discuss how the above recommendations can be achieved. The present situation of climate change in Serbia is described in the following.

Serbia is not considered as a significant emitter of carbon dioxide. In the territory of Serbia, this gas is primarily generated through the combustion of fossil fuels in power plants and heating plants, in transport

and partly by households which are heated in this manner. The identified problems include lack of a national inventory of greenhouse gasses and lack of strategic documents on climate change (a strategy for implementation of clean development and national strategy for climate protection). It is important to stress that legislation on emissions is not harmonized with that of the EU, as well the existing institutions are not adjust to the needs of active implementation of climate protection policy and obligations resulting from the international agreements (UNFCCC, Kyoto Protocol) (GRS, 2008, pp.89-90).

To solve those problems means to establish more institutions regarding the problem of climate change. Existing institutions are not sufficient. As it is said in the strategy, beside the Environmental protection agency, which is linked with European environment agency (EEA) and European environment information and observation network (EIONET), there is a need for new institutional structure. One of them is the Agency for sustainable development, which can become operational through establishing and strengthening the new institution, such as the National centre for climate change (GRS, 2008, p. 113).

The issue of spatial planning is not particularly considered within the Serbian sustainable development strategy. This is the main difference between Serbia and the developed countries. The result of inadequate planning policies can be seen on the example of Belgrade.

4.2 Belgrade

Belgrade, as a city in transition, is undoubtedly interesting due to its investments and building in suburban zones. Greenfield investments in the area of Belgrade are popular because of the following (Gligorijevic, 2007, p. 86):

- lack of appropriate legal and financial framework of business and investment (unknown origin of capital, unfavorable credit conditions, typically relying on transitional benefits through corruption in all sectors, etc.)
- cheap suburban unsettled land that is planned for construction
- favorable privatization of state-owned enterprises in urban locations and
- large inflow of capital of different origin.

In terms of socio-economic transition towards market economy system, the problem of brownfield sites is unjustifiably neglected. In addition to this, the concept of brownfield sites is not yet officially defined. In the Master plan of Belgrade for 2021, which was published in 2003, there is no request for revitalisation of existing brownfield sites. The city government creates the possibility of greenfield investment by attracting investors in accordance with their requirements and needs of the assigned use of undeveloped land. Also, the term 'brownfield regeneration' is not even mentioned explicitly in the new Law on planning and construction (2009), while the concept of urban renewal occurs only in the glossary. Benefits of brownfield regeneration have been recognized by the experts, but their implementation in new planning documents is expected in the future.

The research results on the effects of brownfield regeneration in Belgrade, conducted by a group of experts are published in the proceedings titled "The brownfield revitalisation in Serbia" (Gligorijevic, 2007, p. 86). The first advantage of brownfield regeneration is significant improvement of the air quality in the city, due to the reduction in number of vehicles. Another advantage is that a compact city, which arises through the development of brownfield sites, requires less energy for heating and cooling. According to statistics, residential buildings with five units use half the energy of individual residential villas (Gligorijevic et al., 2007, p.132).

Another advantage of the brownfield regeneration refers to the fact that densely built parts of the cities do not have too many open areas, as well as the large swimming pools, which are an integral part of individual family houses on the outskirts of the city. This contributes to water and tanks use reduction and therefore reduced possibility of contamination.

As the following argument, which goes in favor of rebuilding within the existing urban area, the authors (Gligorijevic et al, 2007, p.134) notify rational use of land, which is reflected in the preservation of existing ecosystems and open space. Also, if there is no need for green space within the existing urban structure, brownfield site can be used as an open space.

In the end, experts say that the brownfield regeneration means clearing potentially contaminated land, which is useful for public health (Gligorijevic et al, 2007, p.133). Investment in brownfield is investment in better living and working environment. In this way, the health risks created by the presence of solid waste, pollution of groundwater and soil are eliminated.

From the previously presented arguments can be concluded that there is a need for integration of the environmental policies into other sector policies, especially in the sector of spatial and urban planning. Firstly, it is necessary to build capacities to implement the strategic environmental assessment of policies, plans and programs, according to the law. Also, the adoption of the Strategy of spatial development of the Republic of Serbia is one of the priorities (GRS, 2008, pp. 73-74). Secondly, in the existing national sustainable development strategy, the land is treated only as agriculture land and not as a resource of the global importance (GRS, 2008, pp.79-80). Other problems in implementing environment protection measures in the area of spatial and urban planning and housing refer to: unsatisfactory inter-departmental and inter-sector cooperation; insufficient training of local government divisions and their weak financial capacity for implementing the duties stemming from legislation and planning (Karadzic and Mijovic, 2007, p.12).

We can understand the relation between spatial planning and climate change from the previous paragraphs. Sustainable development strategy is seen as an instrument for notifying environmental problems and defining solutions to minimize negative environmental impacts. The potential of strategy is presented in considering alternatives and the expected changes within law regulation and the strategy will contribute to more environmentally sound plans (Crncevic and Therivel, 2009, pp.102-103).

5 CONCLUSIONS: TOWARDS PLANNING SUSTAINABILITY

The Kyoto Protocol specifies that all developed countries are obliged to reduce greenhouse gases emissions between 2008 and 2012 by an average of over 5% as compared to 1990 levels. Therefore, the developed European countries' goal is greenhouse gas emissions reduction. Developing countries are not subject to such obligation under the Kyoto Protocol, but they have to consider the climate change issue as well.

The climate change has impact on spatial planning in the developed European countries. Economical use of land, compatible with nature and society, is essential element of sustainability. Within the EU framework of spatial and urban planning legislation, many instruments of sustainable development already exist and are used. Profitable land use supports sustainable development. For example, profitable is the reuse of land which has fallen into disuse, or the release of land which have not been used for a long time.

Developed European countries (Sweden, the Netherlands, Germany) and Serbia strategies comparison shows that climate change is equally important to all of these countries and that they have common idea on environmental protection and sustainable development.

Regarding Serbian experiences presented previously in this paper, it should be noted that environmental issues are quite well presented in the strategy. However, strategy implementation is not yet seen as a process, so there is a need to integrate strategy with plan making process. The lack of both relevant institutions and planning documents measures is obvious. Plan implementations are not sufficient. Spatial monitoring and reporting are deficient as well.

To achieve sustainability, Serbia planning policy should perform the following activities:

- make climate change adaptation a core objective of spatial planning
- combine change and risk management approaches to integrate climate change adaptation into planning
- harmonize current legal framework with strategy and planning process
- strengthen public involvement
- fund appropriate research on climate risks during early stage of spatial planning process
- develop long-term solutions to address the challenges that climate change poses to existing land uses.

These activities can be achieved by adopting and implementing the National Environmental Strategy of Serbia. That strategy implementation requires capacities improvement of institutions relevant to

environmental protection, such as the Environmental protection agency, the Environmental protection fund, the Agency for sustainable development and others.

The knowledge on climate change is developing rapidly. Spatial plans should protect communities against climate change risks and take advantage of eventual opportunities that climate change may bring. Long term spatial plans and measures must be revised regularly in order to be effective. It is important that spatial plans are reviewed according to the latest climate change data.

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