# CONCEPTUAL MODELS FOR SUSTAINABLE DEVELOPMENT AT REGIONAL LEVEL

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**Abstract**

*The research undertaken at national and international level shows the the spatial approaches induce a series of specific aspects in tackling with the concept of sustainable development, wich have an important influence on the content of regional policies. This paper discusses these aspects and entailed influences based on a couple of conceptual models proposed by leading scholars in the field (e.g. van Veen-Groot,Nijkamp, Baggen, van der Knapp, Hansen). The conclusions point to useful lessons for environmental management in relation to regional development.*

**Keywords:** sustainable development,space,regional policies, conceptual models

**JEL Classification:** Q01, Q56, R11

## Introduction

Nowadays there is an ever increasing concern with ensuring sustainable development at regional level and with investigating this phenomenon, shown by both public authorities and academia. A major document defining this orientation is the "Green Paper on Territorial Cohesion", stating: "Policies related to ensuring territorial cohesion are centered on the sustainable use of specific features of the different regions that have the potential to reduce disparities and increase competitiveness" (European Commission, 2008, p.3). It was followed in by the Territorial Agenda 2020 (European Commission, 2011), explicitly entitled "Towards an Inclusive, Smart and Sustainable Europe of Diverse Regions". It addresses the territorial cohesion as "a set of principles for harmonious, balanced, efficient, sustainable territorial development" (p.3), requiring "more sustainable and resource efficient economic structures" (p.4). The document underlines that "the well‐functioning ecological systems and the protection and enhancement of cultural and natural heritage are important conditions for long‐term sustainable development" (p.8). At country level the regional operational programmes and environment sectoral operational programmes of the member countries reflect these goals in a correlated manner.

In accordance with this vision, there is a particular increase in the interest and involvement of local government, civil society and business community in order to transform regional economies into sustainable, "green" ones (Hansen, 2013).

On its side, the fundamental scientific research dedicated a lot of studies to the conceptualisation of the complex real world of sustainable development, aiming to contribute to its proper understanding via system representations, with specific concepts, terms and investigation instruments. Further on, a plethora of applied studies concentrated on well-defined components of these systems and on systems as a whole from a practice oriented perspective.

This paper proposes an inquiry into some relevant conceptual models for sustainable development at regional level proposed in the international arena, discussing their relevance and implications for developing and implementing competitive policies for sustainable spatial development.

## Conceptual models

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Sustainable development in space refers basically to socio-economic development compatible with environmental criteria of a space-based system, taking into account specific objectives of the component areas. All key elements of sustainability - "equity (the achievement of widespread social justice in the distribution and accessibility to resources both in space and time), environment (acknowledgement of nature's rights and values), development (economic development able to guarantee both the quality and quantity of natural resources)" – are taken into consideration in this respect (Barbanente et al., 1994, p.1), the ultimate goal of sustainable regional development being "the integration of sustainable development principles into regional development practice" (Clement et al., 2003).

In association with the regional approach to sustainable development literature highlights a number of types of sustainable development, such as strong and weak sustainable development, or internal and external sustainable development. The first concept involves improving all components of welfare function, while the second implies an increase in welfare, but trade-offs between positive and negative changes in some components are allowed. Internal sustainable spatial development refers to sustainable development in a given area, while the external one relates to sustainable development in adjacent areas; both internal development and the exterior can be both weak and strong (Nijkamp et al., 1996).

Sustainable development of a region depends on the strength and capacity is has to attract and develop various economic activities (Koufodontis et al., 2007).

Achieving socio-economic and spatial sustainable development implies to ensure adequate quality of life and access to all necessary services and requires the action and interaction of many factors, as evident from Figure 1.

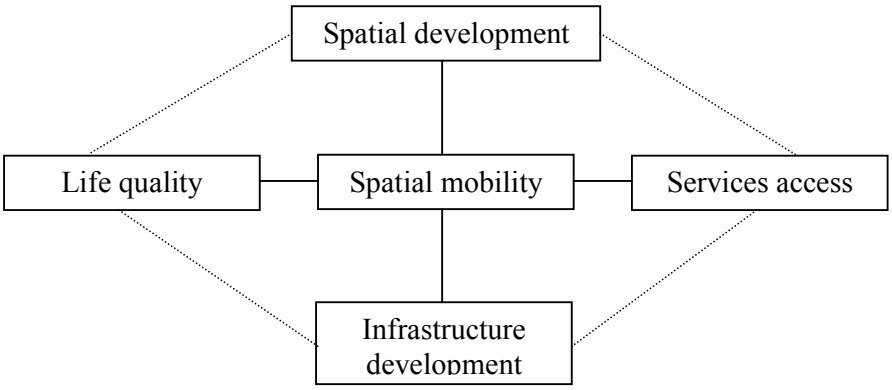


**Figure 1.** Spatial mobility – involved forces
**Source:** Nijkamp et al., 1996, p.504

Also, taking into account the interactions shown in the Figure 1, it is very important that the company be organized in a way that enables achievement of sustainable development. A conceptual model associated with the previously set which can be easily converted into an operational one, to be tested, is shown below (Figure 2).

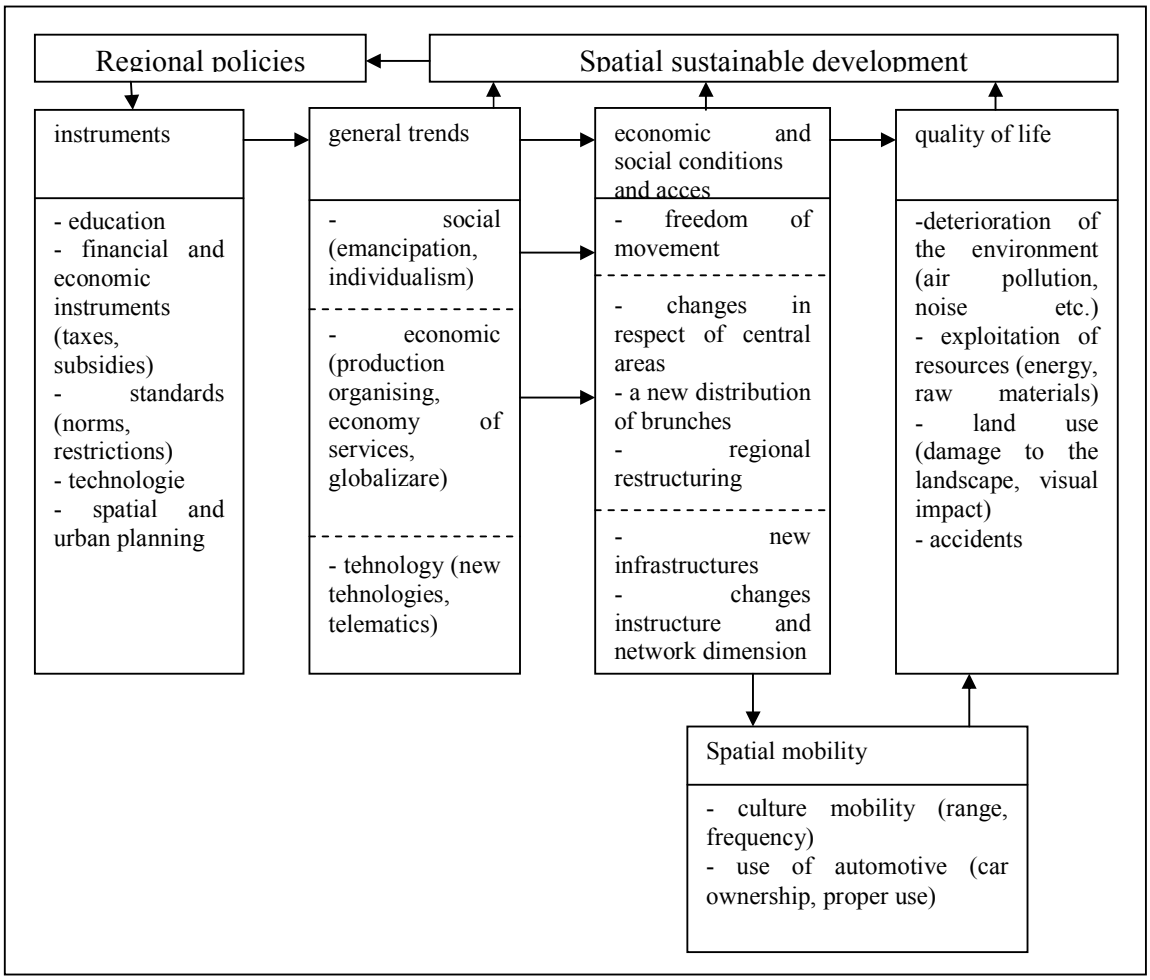


**Figure 2. Conceptual model for spatial sustainable development**
**Source:** based on Nijkamp et al., 1996 cited in Constantin, 1998, p. 196

Ensuring a high level of sustainability of natural resources, cultural, human and infrastructure is considered a strategic objective (Oreja Rodríguez-López Parra Yanes-Estévez, 2008). In order to implement a strategy of sustainable spatial development, along with explicit criteria for protecting the environment are taken into account various criteria, as highlighted Masser et al. (1992) cited in Sava (2007): external conditions, aimed at population dynamics, macroeconomic development and international developments; spatial distribution of economic activities and urban, suburban, peripherals areas; types of mobility of people and goods distribution; technological change; scale transport systems; intervention policies on transport.

**Scenario representations**

Developing and implementing competitive policies for sustainable spatial development requires an assessment of the situation beforehand and evaluation of possible future situations; for the latter case, the most commonly used method is the formulation of scenarios. According to Nijkamp et al. (1996) and Masser et al. (1992) there are some basic criteria to be taken into account when drawing up scenarios associated sustainable spatial development, namely:

• external circumstances (demographic changes, migration, changes in the level of employment in the participation rate, lifestyle etc.; macroeconomic development and international developments, including dynamic power blocs, alliances);

• spatial distributions ( change in the concentration / diversification of economic activities in space; complex changes in the patterns of urban, suburban or peripheral areas);

• mobility patterns (change in behavior on commuting, recreation, travel frequency, etc.; qualitative changes in the distribution of goods (e.g. high value, low volume, etc.));

• technological changes (technology development in manufacturing vehicles (e.g. electric cars); improved infrastructure networks; introduction of telematics for management of shipping, etc.);

• scale transport systems (national or local interest roads; trans-European networks);

• intervention policies on transport (price and tax regulations (e.g. fees for traffic on highways); organizational and institutional rules on transport systems).

Accordingly, a wide range of scenarios have been developed. For example, considering the globalization context, van Veen-Groot et al. (2001) proposed four scenarios, namely: first, based on "high growth and strong technological development"; second, envisaging "polarization and migration"; third, considering "dynamic economies and instability" in the OECD area; fourth, based on "environmental awareness and low growth" (p.24). In such scenarios a defining starting point is represented by the expected effects of globalization: scale, structural, technology and product effects (van Veen-Groot and Nijkamp, 1999). As a response, quality development should prevail over quantity, with a strong emphasis on "more environmentally conscious consumption patterns, energy efficiency, product durability and a more efficient spatial distribution of activities" (Lonergan, 1993, p. 337).

In addition, the objectives of sustainable spatial development are supported by measures, instruments and reflected by appropriate indicators. Environmental policy instruments aimed at pursuing transformation processes in society to become compatible with sustainable spatial development can be represented, for example, by fines or surcharges, the transmission of information, etc. Indicators are selected for planning and communication, and for identifying problems, resource allocation, policy evaluation, etc. Also, along with value indicators, specialised literature is promoting the use of physical indicators, such as "pressure" indicators, in order to highlight the evolution of pollution, impact indicators that show changes in the quality of environment and sustainable development indicators, linking the first type of indicators with criteria for sustainable use of resources (van den Bergh, 1996, cited by Constantin, 1998).

**Conclusions**

Considering the above, it can be appreciated that there is a major concern for development and, especially, the implementation of environmental management based on policies that provide solutions for environmental protection, to maintain or even improve the environment for economic growth, economic efficiency, i.e. to achieve a sustainable spatial development. In addition, environmental management should be addressed as a basic component of macroeconomic management. Such an approach should be applied not only at national level, but also at cross-country level or regions. For example, cross-border pollution is a problem that must be managed in all affected countries. Thus, it is necessary to adopt environmental policies that are based on a series of calculations, evaluation and

exploitation of resources, determining the value of services provided by the environment, internalization of costs, determination of damage on the environment and their recovery from the guilty, waste management, resource allocation necessary for environmental protection, the commensuration of influences on prices, national accounts and on macroeconomic indicators, etc. (Gradinaru, 2000).

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