

# Quantifying Progress within Sustainable Development

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## Abstract

*The development, implementation and monitoring of sustainable development strategies, both at international and national or even at local level, must be based on a deep and lucid analysis of the economic, social and environmental aspects, an analysis that requires an important volume of information. In this context, to establish a system of indicators that should answer as well as possible the requirements represents an indispensable approach.*

*The purpose of the hereby paper is to highlight the preoccupations at the international and national level to achieve a unitary system of indicators regarding sustainable development.*

*At the same time, the paper shows the evolution of some indicators of Romania's sustainable development, as compared to the European Union's, between 2001 and 2007.*

**Key words:** *sustainable development, quantification, sustainable development indicators, European integration, strategy*

**JEL Classification:** *Q01, O18, O47*

## Introduction

The concept of sustainable development is relatively new in the modern economic literature – the first warning – in the sense that the world's economic and social evolutions as a whole cannot be separated any longer from the consequences of the human activity upon the natural environment – made in the report in 1972 by the Club of Rome, called “The limits to growth”. Thus, it is acknowledged that Terra has a limited capacity to meet the ever-increasing demand of natural resources by the social-economic system and to counteract the destructive outcomes of their use.

The problems concerning the balancing of the social, economic issues and the impact of the human actions upon the environment came into the attention of the international community in the first UNO's Conference upon the Environment (Stockholm, 1972), which materialized in the sessions of the World Commission on Environment and Development in 1985. As a matter of fact, the Report of this Commission, shown in 1987 (also known as the Brundtland Report) also contains the first accepted definition of the sustainable development: “a development that meets the needs of the current generation without compromising the chances of the future generations to meet their own needs”.

From that moment on, the problems concerning the sustainable development have been paid special attention to, thus being granted an international political dimension. Sustainable

development was the object of some World Conferences, on which occasions there were adopted a series of international conventions by means of which states established precise obligations and terms in this domain.

Roughly speaking, the concept of sustainable development is, today, accepted and supported worldwide, and has become a strategic objective for the whole mankind.

Starting from the idea that, by means of the social indicators there can also be included the objectives of the sustainable development programs, some specialists consider that the elements of sustainable development are embedded in the life quality paradigm<sup>1</sup>. This assertion is also supported by the fact that many of the sustainable development indicators are integrated in the larger system of life quality indicators.

## **Preoccupations regarding the Quantification of Sustainable Development**

In parallel with the process of defining the sustainable development concept and strategies, there have also evolved the preoccupations with its monitoring and quantification. The need to have information that may allow as precise a measurement as possible of the sustainable development progress has determined the involvement of a variety of institutions and people in this respect, from civil society groups, groups of experts or research centres, to local administrations, national governments, intergovernmental organisations or international financial institutions.

Today, there are various preoccupations and concern about the continuous improvement of the informational systems developed at national and international levels as well as at the local level that may quantify the aspects of the economic and social life from the perspective of sustainable development.

Besides the quantification of the classical economic and social components that have been taken into account throughout time and for which the current systems of indicators meet the national and international analysis and comparison traditional requirements, the new sustainable development pattern requires the introduction of other indicators that should analyse various aspects that resulted from the current and future preoccupations of development.

These aspects refer both to the economic environment (employment, long-term unemployment, the introduction and the use of new technologies, more efficient as concerns the consumption of non-regenerative raw materials, non-polluting technologies, the use of substitutes, waste recycling etc.), to the natural environment (polluting substances and factors, the pollution level of the environment, the area and quality of forests etc.) and to the social one (poverty, social exclusion, the occurrence of certain diseases, in-service training etc.).

The data, the information and the indicators play a crucial role in the substantiation of decisions and in the measurement of progress in reaching the objectives of sustainable development (“We measure what we value and value what we measure”- UN Commission for Sustainable Development, 2001). The important role of sustainable development indicators in providing the information required for the substantiation of decisions at each country’s level was acknowledged in 1992 in the Earth Summit in Rio. The acknowledgement of the role of sustainable development indicators is largely highlighted in chapter 40 in Agenda 21 – Information for decision-making<sup>2</sup>. For instance, in art 40.4 it is stipulated that “the indicators of sustainable development need to be developed to provide solid bases for decision-making at all

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<sup>1</sup> Mărgineanu, I., „Modelul social românesc din perspectiva calității vieții populației”, *Calitatea vieții*, XV, nr. 3-4, 2004, p. 214.

<sup>2</sup> Dollfus, É., *Des outils aux systèmes: propositions méthodologiques pour articuler indicateurs et complexité*, Centre d’écologie humaine et des sciences de l’environnement, Genève, 2006.

levels – international, national, local – and to contribute to a self-regulating sustainability of integrated environment and development systems”.

The importance of setting up a set of sustainable development indicators is also highlighted by the Report of the Secretary General of UNO in the General Assembly of the United Nations on the 6<sup>th</sup> of September 2001, where it was emphasized the necessity to develop a system of indicators that should correspond to the Objectives of the Millennium<sup>3</sup>.

Throughout time, there have been numerous preoccupations to achieve some systems of indicators of sustainable development both at national and at the level of some international bodies, thus developing a series of regulations, principles that should help this endeavour. The most significant moments, recorded at international level, in the development of some systems of indicators for the sustainable development are:

- Agenda 21 (1992) which, in chapter 40, enumerates the objectives pursued by the system of indicators, the activities to be achieved, the institutions involved and the means used, starting from two basic elements, namely the elimination of the “gaps” that exist as regards the information and the improvement of the access to information.
- The Bellagio Principles (that refer to the preoccupations of an international group of specialists from 5 continents, who met in November 1996 at Bellagio Study and Conference Center of Rockefeller Foundation), materialized in 10 principles that must be taken into account when evaluating sustainable development.
- In 1996, the United Nations Commission on Sustainable Development (UN-CSD 1996) put forward a list of 134 indicators, defined by reference to the principles and policies established in Agenda 21 and which were to be tested in several countries<sup>4</sup>;
- In 1997, with the support of the United Nations, EUROSTAT developed a pilot-study called “Indicators of sustainable development”<sup>5</sup>, which recorded 46 European indicators; the results of the pilot-study were analysed by EUROSTAT together with the countries that took part in the study, and there was proposed a system of indicators for the sustainable development that was to be developed and used by the Member States.
- The United Nations resorted, in 2001, to the revision of the sustainable development indicators, putting forward a system (UN-SCD 2001) structured on 15 themes, 38 subthemes and 58 indicators, for 4 pillars:
  - the social pillar: equity, health, habitation, safety and population;
  - the environment pillar, that comprised the following themes: atmosphere, land, oceans, beaches and seas, flowing waters, biodiversity;
  - the economic pillar, with the following themes: the structure of the economy, consumption and production;
  - the institutional pillar: The institutional capacity and the institutional framework<sup>6</sup>.
- In 2005, there began the revision of the European Strategy for Sustainable Development (adopted in Goteborg in 2001) that as finalized in June 2006. On this occasion there were

<sup>3</sup> Dollfus, É., *Des outils aux systèmes: propositions méthodologiques pour articuler indicateurs et complexité*, Centre d'écologie humaine et des sciences de l'environnement, Genève, 2006.

<sup>4</sup> United Nation Commission on Sustainable Development, *Indicators of sustainable development: framework and methodologies*, New York, 1996.

<sup>5</sup> United Nation Commission on Sustainable Development, *Indicators of sustainable development - A pilot study following the methodology of the United Nation Commission on Sustainable Development*, European Communities, Luxembourg, 1998.

<sup>6</sup> Cenni, F., Jolliet, O., *Environmental Policy via Sustainability Indicators on a European – wide NUTS – III level*, EU Contract IST-2001-32389, 2003.

also revised the sustainable development indicators, in the sector of monitoring the progress and evaluation of the implemented policies. The new system of indicators relating to the European Strategy 2006 includes 10 themes that reflect the political priorities of the strategy and the commitments undertaken<sup>7</sup>: economic development, poverty and social exclusion, the ageing of the population, public health, changes of the climate and energy, the production and consumption modalities, the management of natural resources, transports, good governing and global partnership.

- In 2005, EUROSTAT also put forward some selection criteria of the indicators used in the evaluation of the Strategy for Sustainable Development 2005, which focused on the following<sup>8</sup>:
  - the indicator must highlight the essence of the measured objectives and must have a clear and accepted interpretation;
  - the indicator must be well developed and statistically validated;
  - the indicator must meet the intervention policies but must not be subjected to manipulation;
  - the indicator must be comparable in the Member States but also with the United Nations and OECD standards;
  - the indicator must be open to periodical revision;
  - the establishment of an indicator must not imply, for the Member States, enterprises or citizens, too much efforts as compared to its usefulness;
- On the 9th of June, 2006 there was adopted the Revised Strategy for Sustainable Development, for the expanded Europe. The general objective of this Strategy is represented by the continuous improvement of the quality of life for the present and future generations, by creating some durable communities, able to manage and use resources efficiently.

In the perspective of the adhesion to the European Union, Romania was preoccupied to develop a set of indicators for the sustainable development harmonised with those of the European Union.

In this respect, it was developed the project Environment Statistical Investigations, within the Phare Program 2001. The main objectives of the pilot-study developed between 1998 and 2002 were the following<sup>9</sup>:

- the improvement of the existing indicators regarding the evaluation of sustainable development, performed by various institutions preoccupied with the environment;
- the improvement of the system of indicators for the sustainable development in Romania;
- carrying on the harmonisation of the informational system regarding the sustainable development indicators with the European Union norms and standards.

In order to create the possibilities to describe the relations between the causes of the problems and their consequences, their dynamics, the set of sustainable development indicators for the environment, put forward by the pilot-study, was established in accordance with the determinant activity pattern – pressures – condition – impact – response (DPSIR).

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<sup>7</sup> European Commission, *Measuring progress towards a more sustainable Europe. Sustainable development indicators for the European Union*, EUROSTAT, Luxembourg, 2005.

<sup>8</sup> *ibidem*

<sup>9</sup> National Institute for Statistics Bucharest, *Rezultatele studiului asupra indicatorilor de dezvoltare durabilă*, 2004.

The domains of interest of the DPSIR pattern for which 51 indicators were taken into consideration for the period 1998-2002 were: the change of climate and energy, transports, the quality of air, waste, the protection of natural resources, agriculture, industry, resources of water.

The selection criteria of the indicators related to: their spatial and temporal relevance in relation to the objective of the pattern, clarity, a balanced ratio between the achievement costs and contribution of information, the objective, scientific, transparent character, the reflection of the objectives of the European Union sustainable development strategies, feasibility, availability and data accessibility etc.

At the same time, within Phare Multi-Beneficiary Programs, in the alignment process of the Romanian statistics to the European norms and standards, namely that of the integration in the European statistics system, of assimilation and observance of the community acquis, the National Institute of Statistics developed and promoted numerous projects related to sustainable development:

- the Urban Audit,
- the Statistics of Water,
- the Statistics of Waste,
- European Interview Investigation regarding Health;
- The Improvement of the quality of life and the stimulation of diversification of economic activities in rural area;
- Environment – the “pesticide” indicator etc.

The efforts of the National Institute of Statistics as concerns the setting up of a quantification system for the sustainable development materialized in the set of indicators (IDD)<sup>10</sup> proposed in 2008, structured on the architecture used by Eurostat, by ranking them on three levels:

- main indicators (basic);
- indicators that can be used for the monitoring and revision of sustainable development programs;
- analytical indicators.

Thus defined, the set of indicators can be used for the periodical monitoring of the progress related to the execution of the strategic objectives for sustainable development and includes economic, social and environment indicators, grouped in the following domains:

- Economic development;
- Poverty and social exclusion;
- The ageing of the population;
- Public health;
- The change of the climate and energy;
- Production and consumption patterns;
- Natural resources management;
- Transport.

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<sup>10</sup> [http://www.insse.ro/cms/files/Web\\_IDD\\_BD/index.htm](http://www.insse.ro/cms/files/Web_IDD_BD/index.htm)

## Romania's Sustainable Development in the Context of the European Integration

We shall analyse the evolution, between 2001 and 2007, of some of the sustainable development indicators, suggested by the National Institute of Statistics Bucharest for our country, which bring out to light important aspects of this domain.

As concerns the dynamics of the Romanian economy, according to the performance recorded in 2006 as compared to the previous year, materialised in a significant increase of the gross domestic product per inhabitant of 8,4% (rates higher than 8,0% were recorded in 2002 and 2004), in 2007 the rate of growth of this indicator decreased a little, being only 6,3% as compared to 2006. However, analysing the evolution of the indicator between 2001 and 2007, as compared to its evolution in EU 27, there can be noticed a positive dynamics, much superior to the European one.

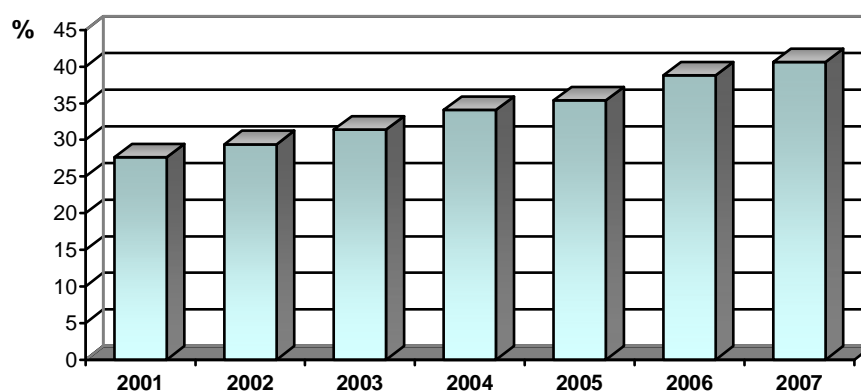
**Table 1.** The evolution of the rate of growth of the Gross Domestic Product per capita, between 2001-2007 (%)

Years	2001	2002	2003	2004	2005	2006	2007
UE 27	1,5	0,6	0,6	1,7	1,2	2,4	2,1
Romania	5,9	8,1	5,5	8,8	4,4	8,4	6,3

previous year=100

Data source: National Institute of Statistics Bucharest, EUROSTAT

This faster dynamics of the gross domestic product per inhabitant in Romania determined a reduction of the lag as compared to the European Union 27; the ratio between the GDP per inhabitant in Romania and that of the EU 27 increased from 27,6% in 2001 to 40,6% in 2007.



**Fig. 1.** The evolution of the ratio between the Gross Domestic Product per inhabitant in Romania and that of the EU 27, between 2001 and 2007 (%)

Data source: EUROSTAT (National Accounts, including GDP)

Another important indicator, which has important connotations in performing sustainable development, is represented by the percent in the gross internal product allocated for investments. Between 2001 and 2007, the volume of investments in Romania increased significantly, the percent allocated from the Gross Internal product for investments reaching 20,7% in 2001, 30,5% in 2007. Another highly important aspect is the fact that, during the whole mentioned period, the GIP percentage allocated for investments in Romania was superior to the one recorded in EU 27.

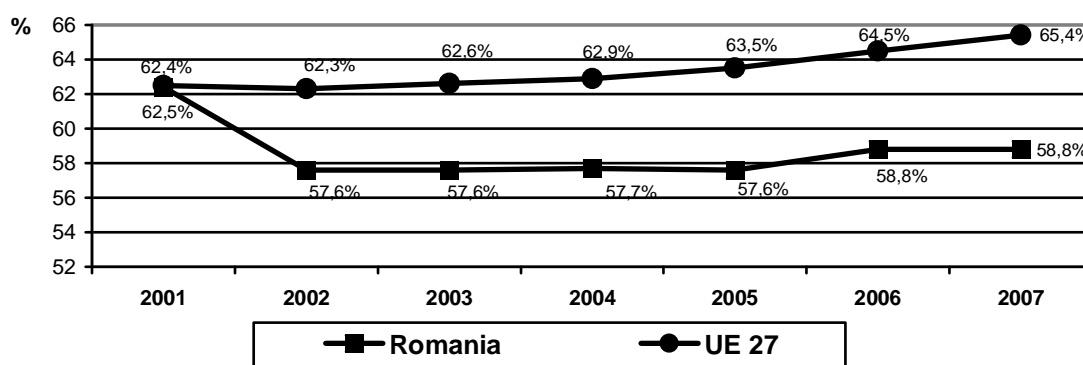
**Table 2.** The evolution of the Gross Internal Product percentage allocated for investments between 2001 and 2007

Years	2001	2002	2003	2004	2005	2006	2007
UE 27	20,2	19,6	19,4	19,6	20,0	20,7	21,2
Romania	20,7	21,3	21,4	21,8	23,1	25,6	30,5

%

Data source: National Institute of Statistics Bucharest, EUROSTAT

The positive evolution of the Romanian economy in the latest years has not been the same as regards the employment area. Thus, the employment rate for the active working population (aged 15-64) increased slightly between 2005 and 2007, namely from 57,7% to 58,8%, the lag between Romania and EU 27 being the same.

**Fig. 2.** The evolution of the employment rate of the active working population in Romania as compared to the one in the EU 27, between 2001 and 2007 (%)

Data source: National Institute of Statistics Bucharest, EUROSTAT (Național Accounts)

From this perspective, as it results from the graphic representation (Figure 2), the Romanian economy declined visibly. This situation was generated mainly by the accentuation of the demographic ageing process, which determined the increase of the percentage of the population of 60 years of age and older in the total of population, a segment characterised by an extremely low employment level. At the same time, the negative evolution of the employment rate in Romania was also influenced by the increase of external migration with the working population.

Another suggestive indicator for sustainable development, suggested by NIS Bucharest, is represented by the BIM unemployment rate which, between 2001 and 2007, recorded a satisfactory evolution both from the point of view of its dynamics and from the point of view of its level as compared to the one of the EU 27's.

**Table 3.** The evolution of the BIM unemployment rate between 2001 and 2007

Years	2001	2002	2003	2004	2005	2006	2007
UE 27	8,5	8,9	9,0	9,0	8,9	8,2	7,1
România	6,8	8,6	7,0	8,1	7,2	7,3	6,4
- male	6,9	8,9	7,5	9,0	7,7	8,2	7,2
- female	5,8	7,7	6,4	6,9	6,4	6,1	5,4

%

Data source: National Institute of Statistics Bucharest, EUROSTAT

From the above-mentioned data there can be noticed, on the one hand, a lower level of the BIM unemployment rate in Romania as compared to EU 27 and, on the other hand, it's slightly decreasing tendency. At the same time, there can also be noticed the lower level of unemployment for the feminine population.

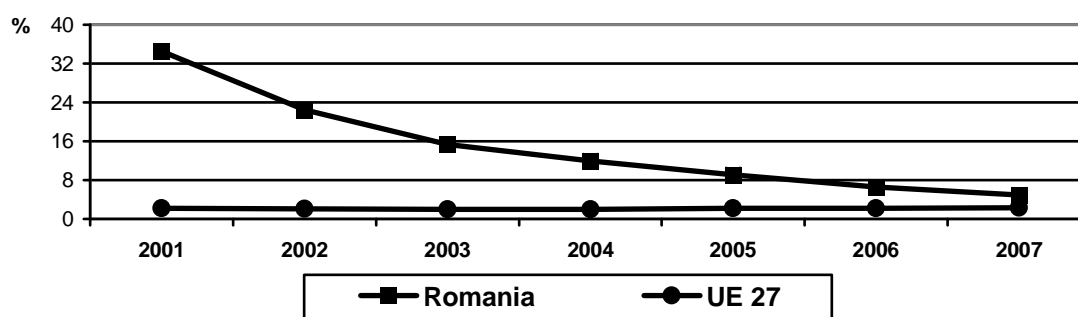
The continuation of the disinflation process represents one of the strategic, essential elements for the economic development of our country<sup>11</sup>. Romania's performances as concerns the reduction of inflation, although slower as compared to other central and East European countries, manifested themselves continuously between 2001 and 2007, decreasing from 34,5% in 2001 to 4,9% in 2007.

**Table 4.** The evolution of the annual average inflation rate\* between 2001 and 2007

Years	2001	2002	2003	2004	2005	2006	2007
UE 27	2,2	2,1	2,0	2,0	2,2	2,2	2,3
Romania	34,5	22,5	15,3	11,9	9,1	6,6	4,9

Data source: National Institute of Statistics Bucharest, EUROSTAT

This descending evolution slowed down the lag between Romania and the EU 27, the ratio between the annual average inflation rates of Romania as compared to that of the EU 27's being reduced from 15,7 in 2001 to only 2,1 in 2007.



**Fig. 3.** The evolution of the annual average inflation rate in Romania as compared to the one in the EU 27, between 2001 and 2007 (%)

The social dimension of the sustainable development is also characterised by a great number of indicators within the system proposed by the National Institute of Statistics. We shall tackle but two of them, namely the rate of poverty and the percentage of the population with a low level of education from the population total.

The transition to the market economy, started in the 90's, led to a real explosion of poverty<sup>12</sup>, the poor population from the population total being estimated for that period between 22% (the estimate of the World Bank for 1994) and 39,3% (the estimate of ICCV and IMF for the same year). Although the social security system survived in a reasonable form to the economic and political shocks, poverty continued to be a serious problem of the Romanian society.

**Table 5.** The evolution of the poverty rate by gender in Romania between 2001 and 2007

Years	2001	2002	2003	2004	2005	2006	2007
Total	16,97	18,06	17,27	18,87	18,23	18,61	18,50
Males	16,68	17,98	16,83	17,70	18,04	18,33	18,30
Females	17,28	18,14	17,68	18,03	18,40	18,88	18,80

Data source: National Institute of Statistics Bucharest, EUROSTAT

The mentioned data mainly show that the rate of poverty kept quite high in the latest years, constantly exceeding the EU27 average. Secondly, we may notice that during the whole period

<sup>11</sup> Done, I., Moroianu, N., *Economie comparată*, Editura Universității din Ploiești, Ploiești, 2004.

<sup>12</sup> Zamfir, C., „Situția sărăciei în România, dimensiuni, surse, grupuri de risc”, *România socială*, no. 2/2001.



under analysis, the rate of poverty recorded for the feminine population was higher than the one for the masculine population.

A suggestive indicator of the social pillar for the sustainable development is represented by the percentage of persons with a low level of education (maximum secondary education) in the population total aged between 25 and 64.

**Table 6.** The evolution of the proportion of the persons with a low level of education between 2001 and 2007

Years	2001	2002	2003	2004	2005	2006	2007
UE 27	35,1	34,2	33,0	31,6	30,6	30,0	29,2
Romania	29,4	28,9	29,5	28,5	26,9	25,8	25,0

%

Data source: EUROSTAT

From the above data, there results that, between 2001 and 2007, the proportion of the persons with a low level of education in Romania decreased, from 29,4% in 2001 to 25,0% in 2007. At the same time, there can be noticed the fact that the level of this indicator is lower in Romania, as compared to the EU27 average for the whole period.

## Conclusions

The development, implementation and monitoring of sustainable development strategies, both at international and national or even at local level, must be based on a deep and lucid analysis of the economic, social and ecological aspects, an analysis that requires an important volume of true, relevant and comparable (in time and space) information.

In this context, to establish a system of indicators that should answer the requirements as good as possible represents an indispensable approach. We may say that today such a coherent and unitary system of indicators for the sustainable development has materialised, both at the global and at the European level. At the same time, we consider that the system of indicators for the quantification of sustainable development in Romania, proposed by the National Institute of Statistics, harmonised with the European one from the point of view of methodology and of content, meets the monitoring requirements of this process and represents one of the important component parts of the European integration policy in our country.

The comparative analysis of the indicators of sustainable development in Romania and European Union suggests that our country recorded some progress (GIP per capita, the unemployment rate, the rate of inflation etc.) but there are, however, some domains in which Romania still lags significantly.

## References

1. Dollfus, É., *Des outils aux systèmes: propositions méthodologiques pour articuler indicateurs et complexité*, Centre d'écologie humaine et des sciences de l'environnement, Genève, 2006.
2. Done, I., Moroiianu, N., *Economie comparată*, Editura Universităţii din Ploieşti, Ploieşti, 2004.
3. Cenni, F., Jolliet, O., *Environmental Policy via Sustainability Indicators on a European – wide NUTS – III level*, EU Contract IST-2001-32389, 2003.
4. Mărgineanu, I., „Modelul social românesc din perspectiva calităţii vieţii populaţiei”, *Calitatea vieţii*, XV, nr. 3-4, 2004, p. 214.
5. Zamfir, C., „Situţia sărăciei în România, dimensiuni, surse, grupuri de risc”, *România socială*, no. 2/2001.
6. Commission of the European Communities, *Sustainable Development Indicators to monitor the implementation of the EU Sustainable Development Strategy*, Brussels, 2005.

7. European Commission, *Measuring progress towards a more sustainable Europe. Sustainable development indicators for the European Union*, EUROSTAT, Luxembourg, 2005.
8. National Institute for Statistics Bucharest, *Rezultatele studiului asupra indicatorilor de dezvoltare durabilă*, 2004.
9. United Nation Commission on Sustainable Development, *Indicators of sustainable development: framework and methodologies*, , New York, 1996.
10. United Nation Commission on Sustainable Development, *Indicators of sustainable development - A pilot study following the methodology of the United Nation Commission on Sustainable Development*, European Communities, Luxembourg, 1998.
11. [http://www.insse.ro/cms/files/Web\\_IDD\\_BD/index.htm](http://www.insse.ro/cms/files/Web_IDD_BD/index.htm).

## Cuantificarea progreselor în domeniul dezvoltării durabile

### Rezumat

*Conceperea, implementarea și monitorizarea strategiilor de dezvoltare durabilă, atât la nivel internațional cât și național sau chiar local, trebuie să se bazeze pe o analiză profundă și lucidă a aspectelor economice, sociale și de mediu, analiză care solicită un volum important de informații. În acest context, stabilirea unui sistem de indicatori care să răspundă cât mai bine cerințelor menționate reprezintă un demers absolut necesar.*

*Lucrarea își propune să evidențieze preocupările pe plan internațional dar și național de a realiza un sistem unitar de indicatori ai dezvoltării durabile.*

*Totodată, lucrarea prezintă evoluția câtorva indicatori ai dezvoltării durabile a României, comparativ cu cei ai Uniunii Europene, în perioada 2001-2007.*