The quantification of the sustainable development at local level

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Abstract: - The paper highlights the necessity of quantifying the sustainable development at local level and the possibility to realize that in Romania. In order to sustain these aspects we present the evolution of the system of indicators at local level, a case study on rural communities and an opinion inquiry. We developed also a methodology for a synthetic indicator at local level, proposing an Index of Sustainable Development at Local Level (ISDL) that summarizes a complex array of information.

Key-Words: - sustainable development, quantification, local level, necessity, possibility, synthetic indicators, punctual indicators.

1 Introduction

As the differences between countries and between various social categories have deepened, under the conditions of weather changes, of the increase in poverty, in unemployment, of the alarming growth of violence, the sustainable development has become one of the main duties of human kind; at the beginning of the new millennium, it is no longer an option but a way to follow.

The sustainable development concept shall start at any level from a deep and clear analysis of economic and social aspects which must be rigorously quantified in order to provide the starting point for the future decision making.

The quantification of the sustainable development is perceived and achieved in different manners, depending on the country, according to problems and weakness or main fields of each country.

The indicators can play an important role by helping countries to make informed decisions concerning sustainable development.

The central role of sustainable development indicators has been emphasized in Agenda 21 which calls on countries at national level, as well as international, governmental and non-governmental organizations to develop this kind of indicators that can provide a solid basis for decision-making at all levels.

Indicators of sustainability are different from traditional indicators of economic, social and environmental progress.

Traditional indicators measure changes in one part of community as if they where entirely independent of the other parts. Sustainability indicators reflect the reality that the three different segments are very tightly interconnected.

2 Sustainable development and concerns on constructing and developing the system of indicators

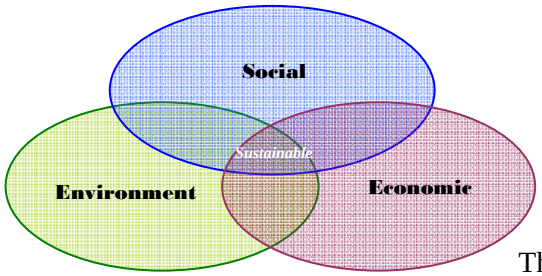
A definition of the sustainable development (actually the best known one) is suggested in 1987, in the Report of the Commission on Environment and Development (the Brundtland Report „Our common future"). In general terms, the sustainable development is defined as „the type of development satisfying the needs of current generations without compromising the possibility of the future generations of satisfying their own needs" [1].

In 1992, during the United Nations Conference held in Rio de Janeiro there has been established the term of „sustainable development", the concept being widely mediated.

By adopting the Convention held in Rio de Janeiro and preparing the Agenda 21, they turn to the concept of sustainable development, in the Brundtland Report, defining the „three pillars" of the sustainable development: the economic progress, the social justice and the preservation of the environment (fig. 1).

The sustainable or the durable development, as certain authors prefer to call it, is thus a multidimensional concept, affecting and aiming at the environment and natural resources as well as the population and the industrial and agricultural production.

Fig. 1
The three pillar of the sustainable development



This is why achieving a durable development (a continuous one, from the temporal point of view), a sustainable one (from the point of view of the possibility of achieving it, of its viability) implies solutions aiming in the same time at the social, political, economic, demographic and technical field.

In addition to quantifying the classical economic and social aspects which were taken into account over time, the new model of sustainable development requires the completion and the detailing of the current indicators systems with others which capture as suggestively as possible various aspects resulting from the current and future concerns of the development (employment, long term unemployment, poverty, social exclusion, occurrence of certain diseases, the degree of pollution of the environment, the surface and the quality of the forests, recycling the wastes etc.).

Recognizing the role of sustainable development indicators is largely emphasized in chapter 40 of Agenda 21 – Information for decision making [2]. For instance, art. 40.4 states that „it is necessary to elaborate sustainable development indicators which make up a useful base for decision making at all levels – international, national, local – and which contribute to the sustainability and self adjustment of the environment and development integrated systems".

The importance of establishing a set of sustainable development indicators is emphasized also in the Report of the ONU General Secretary in the General Meeting of United Nations of 6 September 2001, where he underlines the need of elaborating an indicators system compliant to the Millennium Objectives [2].

At the European level, the new indicators system related to the European Strategy 2006 consists of 10 subjects reflecting the political priorities of the strategy and the commitments taken on [3]:

⇒ the economic development;
⇒ poverty;
⇒ social exclusion;
⇒ ageing of the population;
⇒ public health;
⇒ change of weather and energy;
⇒ production and consumption means;
⇒ natural resources management;
⇒ transportation;
⇒ good management;
⇒ global partnership.

Each EU member state has developed its own strategy of sustainable development, in compliance with the decisions of the European Council and with the provisions of Agenda 21. In this context, each European Union member state is aiming at a set of indicators allowing quantification of the sustainable development.

2.1 Synthetic indicators and the sustainable development

Even the synthetic indicators cannot provide a complete image on the development in the same as a complex indicators system, they are appreciated for their scientific character and for the extra information they bring. So, the synthetic indicators may be successfully used for the hierarchical distribution [4] of various territorial entities, from the perspective of the sustainable development.

The most known synthetic indicators used for the quantifying of the sustainable development are:

-HDI - Human Development Index – a composite index, measuring average achievement in three basic dimensions of human development –a long and healthy life, knowledge and a decent standard of living [5]. Each sub-index (D_i) is calculated using the formula:

$$D_i = \frac{x_i - \underline{x}}{\bar{x} - \underline{x}} \qquad (1)$$

where x_i denotes the actual value in country i and $\bar{x}(\underline{x})$ refer to exogenous maximum (minimum) values;

-ISEW - Index of Sustainable Economic Welfare – an economic indicator that rather than simply adding together all expenditures like the gross domestic product, consumer expenditure is balanced by such factors as income distribution and cost associated with pollution and other economically unsustaining costs [6];

-GPI - Genuine Progress Indicator is a concept in green economics and welfare economics that has been suggested as a replacement metric for gross domestic (GDP) as a metric of economic growth; is an attempt to measure whether or not a country's growth, increased production of goods, and expanding services have actually resulted in the

improvement of the welfare (or wel-being) of the people in the country [7];
-HWI - Human Well-Being Index - is considered by some authors a more realistic measure of socioeconomic conditions than narrow monetary indicators such as the Gross Domestic Product; it also covers more aspects of human wellbeing than the Human Development Index [8].

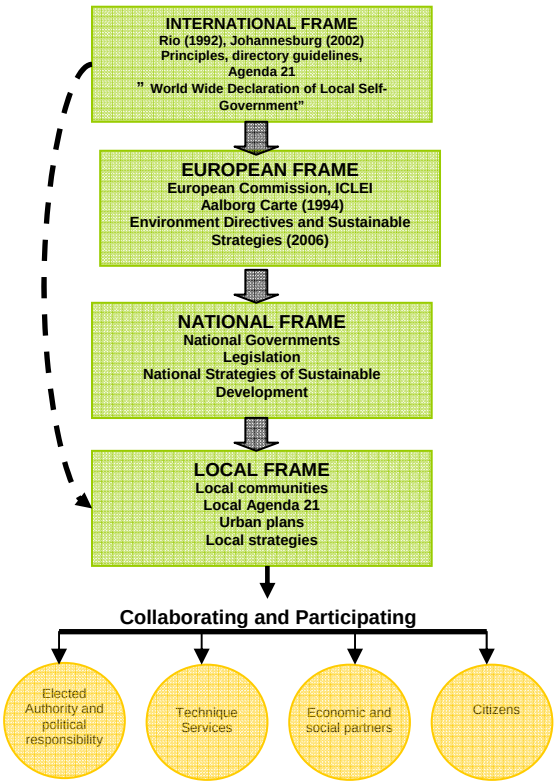
3 The sustainable development at local level

What is certain is that especially after 1990, there have been and there still are serious concerns, both at the national level as well as at the level of certain international organisms, for finding the most appropriate means and ways of quantifying the sustainable development, of measuring the progress recorded in this field and of assessing the results of applied development policies.
For communities with economic, social or environmental problems, indicators can point the way to a better future, help create a shared vision of what the community should be.

3.1 The necessity of the quantification of the sustainable development at local level

Communities are multidimensional, reflecting diverse realities and consisting of complex interactions and networks.
At local level, the sustainable development is aiming at in addition to solving environment related problems, eliminating the economic and social discrepancies between the communities, occurred on the background of the different rhythm and pattern of their development over time. As such, there must be taken into account a series of aspects which have mainly generated problems and differences between different local communities, of economic, social, cultural, environmental type, as for instance the asymmetries between urban and rural area, between the local communities located in different geographic areas (isolated and having relief related problems), having different customs (cultural, religious, artisan) etc. The phrase inclining to become generally accepted „think globally, act locally" is also appropriate for the sustainable development field, considering the information stated above.
The economical and social analysis at local level may be achieved only on the basis of a well structured and sized statistical indicators system (punctual and synthetic indicators), reflecting, as much as the existent the information allow it, the economical and social evolution from the sustainable development perspective.
The necessity of the indicators system at local level consists first in its utility in grounding the development strategies, strategies on which the affirmation of local policies are based.
At this level, the system of indicators related to that policy shall measure the success in achieving the set of objectives and after the implementation of the policy, the indicators must be used for monitoring the strategy and they shall be finally used as evaluators of the success of that strategy.

Fig. 2
Institutional frame of sustainable development strategies at local level [9]



Second, the local authorities must dispose of the levers necessary for meeting the eligibility criteria required by the external financing programs. One of these levers is arguing the requirement of funds of information as much as current, conclusive, complete and especially taken from original sources, concerning that community. The indicators system made up officially at the level of local authorities actually represents the most viable and reliable solution in order that the limitation of the access to European funds not to be caused among others by the lack of official indicators supporting the submitted documentation.

Manuscript received November 3, 2007; revised May 7, 2008

The role of the local authorities, by the urban planning and land management policies and by the landscape policies is decisive. The urban planning and land management policies may be achieved only on the basis of conclusive information concerning that area. The lack of such information shall make the work of specialists, of architects very difficult, representing a real problem for preparing the required documentation, of GUP (of General Urban Plan).

The information at local level are necessary also as a result of the numerous requests from various national or foreign investors, which in order to develop their activity, carry out feasibility studies, on the basis of which they may decide on the opportunity of achieving the objective set in the assessed area.

The growing need of information at the city level concerning the quality of life, the degree of development, the achievement of studies and comparative analysis, taking into account the poor representation of them in the current statistics and sometimes even in the lack of availability of certain indicators, has lead to starting an Urban Audit project (a project initiated in 1998, managed by The General Directorate of REGIO for regional policies and by EUROSTAT).

The lack of statistical indicators at local level in general and in particular the lack of the ones concerning the quality of the environment, the revenues and the consumption of the population, the dimensions of poverty, of the social exclusion etc. has been a constant one and has been also felt by the ones carrying out researches in the economic and social field (researchers, professors, students).

Out of the presented aspects, we can observe the need of updating and developing the current indicators system at the local level from the sustainable development perspective. The quantification of the sustainable development may be achieved both by using a punctual indicators system, oriented towards various problems as well by using synthetic, aggregated indicators, which convey by a single numerical expression the level of the sustainable development.

3.2 The evolution of the system of indicators at local level in Romania

The economic, social and politics situation of Romania before December 1989, a country with a centralized type economy, has created specific conditions for the existence of a statistical indicators system both at the national level as well as the territorial level (county and locally).

The relatively low number of economic agents, their size as well as the coordinating and centralizing institutions, at the county level, made possible to carry out exhaustive statistical research in most of economic-social fields, as well as to perform on an annual basis the Animal Census. The advantages of exhaustive research were reflected both in the statistical indicators system at the national level as well as at the county and local level, which indicators were found at the national level, and existed in the same structure also at the county and locality level.

The National Institute of Statistics (Central Direction of Statistics at that time) has prepared the *Statistical book of the locality*, which was issued (after the territorial reorganization in 1968) in three editions, covering the following time periods: 1968 - 1975, 1975 – 1985, 1985- 1995.

The last statistical book of the locality has been replaced starting from 1992 with the Locality Record. The information contained in the statistical book of the locality was structured in chapters and covered mainly the following fields:

- ⇒ General data;
- ⇒ Population;
- ⇒ Labour force;
- ⇒ Industry;
- ⇒ Agriculture;
- ⇒ Forestry;
- ⇒ Investment – constructions;
- ⇒ Transportation;
- ⇒ Telecommunications;
- ⇒ Finances;
- ⇒ Education;
- ⇒ Culture and art;
- ⇒ Health protection;
- ⇒ Tourism;
- ⇒ Public utilities, etc.

The passing of Romania, after 1989 from the centralized economy to the market economy, the appearance of new economic agents and the increase of their number in geometrical progression, the prices liberalization, CAP (Agricultural Production Co-operatives) abolition, restructuring, privatization, liquidation of large economic units etc. have influenced the evolution of the information system in general but especially of the official statistical one. The mass of economic agents which have come into existence after 1990 has lead to renouncing to the exhaustive character of statistical inquiries, most of them being carried out based on samples, which are representative in most cases only at the national and regional level.

Whereas at the national level the statistical

Manuscript received November 3, 2007; revised May 7, 2008

indicators system has been permanently monitored (especially by the National Institute of Statistics), updated and aligned to internal and external information requirements, at the local level, the things have evolved more slowly. Thus, at this level not only we lack enough information related to monitoring of a sustainable economy, but there is no information for the current quantification of the economic and social development in general.

At present, the only official indicators system at local level is the one of the National Institute of Statistics, called The Local Data Base (BDL). BDL shall be maintained and updated every year, by the County Statistics Offices, on the basis of indicators resulting from various statistical studies in the field or from administrative sources, which contain data at the local level, validated at the central and territorial level. The time horizon of the local data basis consists of the following year's series: 1970-1975, 1980- present time. Containing indicators – grouped on 10 economic and social fields – whose content and calculation methodologies is harmonized with the European and international norms, having a unitary, standardized character, at the national level, BDL insures and guarantees a social and economic analysis of local units under comparable conditions from the methodological, territorial and dynamic point of view.

Unfortunately, BDL does not contain any information necessary for the complex characterization of the locality, especially from the sustainable development perspective. Transposed on paper, BDL or the Locality Record consists of no more than 6 pages of indicators, compared to the almost 100 pages of the Locality statistical book. Without upholding the idea that BDL should also consists of 100 pages, we found that there are missing a series of very important information, not only in terms of sustainable development but also for the current characterization of the locality.

Thus, there are missing data concerning the industry, the economic power of the locality, the amount of sales of goods, export, environment protection, local budget, inhabitants' revenue, employed population, unemployed people, number of economic agents and the lists may continue.

In addition, BDL has not only been completed with new information, but there was existing information which was taken out (as for instance information concerning the animal stock, the cultivated surfaces, and the agricultural production).

The County Statistics Offices own statistics information at the local level, which may be obtained by additional processing and which are not found in BDL (population on age groups, number of marriages, number of divorces, number of accommodated tourists – total, number of accommodated foreign tourists, number of museums, etc.). BDL do not contain information resulted from the centralization of the Population and Dwelling Census as well as the Agricultural Census.

Besides BDL, the indicators on locality may also be found in a series of documents prepared based on legal regulations, which represent own sources or internal sources of local public administration: Local Budgets, The Agricultural Register of the locality, The Civil Status Registers, The Statute of the locality.

There is significant statistic information which may also be found in the records of various decentralized institutions of the central administration (the County Agency for Employment and Vocational Training, The County Office of Pensions, The General Direction of Public Finances, The County School Inspectorate, The County Inspectorate of Culture, The County Direction of Public Health, The County House of Health Insurance, The County Agency of Environmental Protection, The Trade Register etc.).

In neither of information sources at local level stated above, there are not specific indicators on sustainable development, as for instance the ones on the environment protection, recycling, social exclusion indicators etc.

Part of this indicators conceived at the national and regional level may be included also in the list of the ones at the local level: total unemployment rate, unemployment rate on gender, long term unemployment rate, unemployment rate for young people, unemployment rate by professions etc, the school dropping rate, the life expectancy, the life expectancy on gender at the age of 65, the occurrence of certain diseases, the number of the people living in polluted areas, areas affected by pollution, the number of people connected to the drinking water network, the electrical power etc..

Besides the fact that the current system of indicators at the local level (regardless of the institution that managing it) has a series of problems related as we have seen, to the content of indicators, to their number and their importance, to their calculation methodology etc, another obstacle for the ones who need information at the local level consists also in the difficulty of acquiring it.

Also, the main own sources of data at the local level may not be capitalized efficiently by the local authorities because of mainly financial problems, of the staff shortage, in particular skilled staff, insufficiently of IT equipment etc.

Proceeding from the information stated above, we

Manuscript received November 3, 2007; revised May 7, 2008

may conclude that at present, at the territorial – administrative unit level, except for BDL, there is not an indicators system well defined, complex, having a clear and well defined methodology and which may allow an analysis from the perspective of the sustainable development.

3.3 The sustainable development at local level, from the transition period perspective – case study: rural communities from Prahova County

In what measure the evolution of the economic and social situation in Romania, after 1989, at local level, has been in agreement with the sustainable development principles, may be appreciated only by using statistical information, which is found at this level. However, can we talk about sustainable development? Are there any progresses in this way? The Romanian statistical informational system may cover the information needs at local level, from the perspective of sustainable development?

In order to answer these questions we realised a study on the economical and social situation of some rural communities from Prahova county, a study which was based on statistical information taken over from DJS Prahova (from BDL and other data bases), from Local hall and from other institutions (Public Health Direction and The Direction for Agriculture and Rural Development).

The analysed aspects emphasize mainly the fact that in many of these rural communities, significant progresses were made in the economic, social and ecologic field:

- Despite the demographic ageing there is yet a good structure of the population on ages;
- The increase of the enrolment of children in kindergartens;
- The rise of the quality of the infrastructure;
- The existence of a garbage removal service;
- The existence of an environment monitoring strategy etc.

There are also negative aspects:

- Demographic ageing;
- Serious agricultural problems;
- Bad health assistance;
- Big unemployment rate etc.

Taking account of these aspects, with an oriented effort both from the authorities and from the communities, at present there may be found the premises necessary for the carrying out in the future a real sustainable development.

Another aspect resulting from the study is the one connected to the informational system for quantifying and monitoring a sustainable development. The data which have been shown and analysed present discontinuities, lacks and required very much collection and processing time. Despite all the measures taken (personally), there were many fields left uncovered or partially covered, regarding important economic aspects (industrial production, commerce, agriculture, forestry, etc.) social aspects (health, education, unemployment, social insurance etc.) and environmental aspects (the level of pollution with certain substances, areas and population affected etc.)

The difficulty of collecting data, the long time required for obtaining them, the impossibility of acquiring more indicators contribute to argue also through this study, the need of achieving an indicators system of the sustainable development at local level, a standardized one, which may capitalize all existing information and which may quantify the economic and social development and serve to monitoring the evolution towards the sustainability.

3.4 Modernization and expansion of the system of local sustainable development indicators between necessity and possibility

For Romania, which has also participated to the Urban Audit project (2003), the improvement of the indicators system at local level and harmonizing the methodology and the contents of the indicators with the European and international requirements is a priority, incumbent mainly on the National Institute of Statistics but also upon the other central and local public administration institutions.

This is however not only necessary but also possible. A significant premise of a sustainable development indicators system at local level is represented by the Local Data Base, at present – as it had been previously stated – the only official system of indicators, existing at the locality level.

Equally, the County Statistics Offices dispose of much other information, which after being processed may be included in BDL.

In addition to the indicators existing in BDL, the data basis of various county administrative institutions contain many pieces of information at local level, which at present are not fully capitalized, at least from the point of view of the various users, but in particular of the local administrations.

The discussions of the management of public administration instructions in Prahova county, had shown that there is the possibility of extracting some indicators at local level, which are found as such or may be calculated form the data basis of these

Manuscript received November 3, 2007; revised May 7, 2008

institutions:

⇒ General Direction of Public Finances;
⇒ County Agency of Employment;
⇒ County Office of Pensions;
⇒ County Agency for Environment;
⇒ Trade Registry;
⇒ County House of Health Insurance;
⇒ Direction of Public Heath, etc.

The Agricultural Registry - managed by the local councils – by the amount of information it contains, might contribute to expanding the indicators system at the local level.

To support the aspects stated above, we have carried out an opinion inquiry called „ The system of sustainable development indicators at local level".

The units sample has consisted of 103 localities halls of the county of Prahova, The Prefect's institution of Prahova County, The County Council Prahova, The County Office of the Regional Development Agency South Muntenia, The Chamber of Industry and Commerce Prahova, the county councils of other counties (Timis, Cluj, Suceava, Olt, Buzau and Bihor).

Subject to the fact that the answers have been influenced not only by the de facto situation but also by the competence and knowledge in the filed of the persons filling in the inquiry form, the results of the centralization of the inquiry have confirmed the above stated aspects on the basis of the personal experience, with respect to the deficiencies and the need of updating the current system of indicators at local level.

4 Proposal of a sustainable development system of indicators at local level

4.1 A possible system of sustainable development indicators at local level

In addition to the general accepted indicators characterizing the social and economic development of a locality (existing in BDL), there is also a need of introducing specific indicators for the local sustainability of the development. Such a system of indicators shall be at the basis of setting the targets of sustainable development and shall monitor in the same time the achievements. Systems thinking and an integrated approach would be more appropriate for dealing with the sustainability of local development [10].

The variant of the system of sustainable development statistical indicators at local level, that we propose, is based on the Local Data Base and is aiming at including specific indicators quantifying the sustainable development and indicators characterizing the local community form the economical and social point of view, not included up to the present time.

Starting from the experience and the trends shaped on the European level with respect to the quantification of the sustainable development, taking into account also the concrete conditions existing in our country, we have proposed the inclusion in the statistical indicators system at local level, in addition to the ones in the BDL, of indicators proper to the sustainable development at the local level, as: population on age groups, distance towards the municipality capital of the county, the percentage of women within the elected local organisms, the degree of participation to the local elections, the surface of forests, the afforested surfaces, the drinkable water distributed, the amount of gas distributed, the amount of urban solid waste, the school dropping, the number of TBC, AIDS. HIV cases, expenses from the local budget for the environment protection etc..

For completing the aspects characterizing the social and economic activity at the local level and aiming also at the sustainable development, even indirectly, we have proposed the inclusion in the system of the following indicators: number of active economic agents - total number and on legal forms, total turnover achieved by the economic agents within the locality, number of marriages, number of divorces, number of vehicles registered in traffic, total revenues to the local level, own revenues to the local level, total expenses from the local level, registered unemployed persons etc.

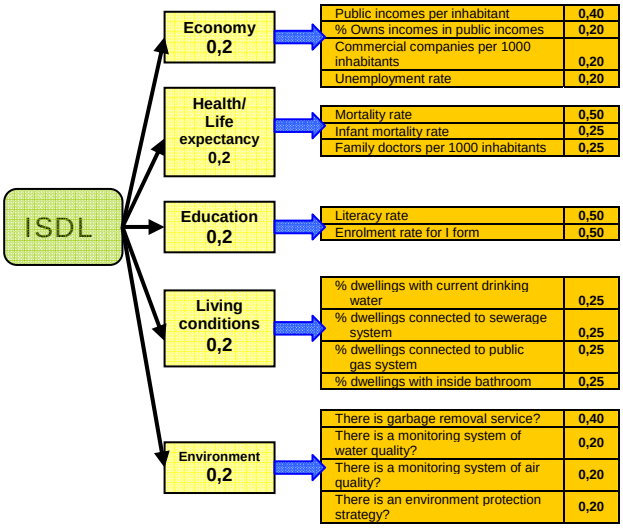
4.2 Proposal of a sustainable development index at local level (ISDL)

Conceiving and calculating a sustainable development synthetic indicator at the national, regional or local level is important on the one hand, as it provides a global perspective, condensed in a single numeric expression and on the other hand as it allows a hierarchical distribution of various territorial entities, from the perspective of the sustainable development. The index of the sustainable development at local level (ISDL) which we suggest [11] is based on the same concept as the Human Development Index (HDI)[5], namely the aggregation of individual indexes, established for certain indicators, suggestively chosen for the sustainable development. For structuring the synthetic index we have proposed the following five

components domains (Fig.3):

⇒ Economy;
⇒ Health/life expectancy;
⇒ Education;
⇒ Living conditions;
⇒ Environment.

Fig.3
The structure of the sustainable development index at local level



The indicators that we have taken into account for the proposed index:

⇒ must be the most reliable for the local sustainable development:
⇒ there must exist information for this indicators;
⇒ there must be included also qualitative indicators for environment;

Taken into account the proposed weigh [12], the five components will be calculated like a weighted average:

$$I_j = \frac{\sum X_j a_j}{\sum a_j} \qquad (2)$$

Where: a_j – weight of individual index (equal for the five indexes)
X_j -the individual indexes

The individual indexes shall be calculated by comparing the actual values with the maximum and minimal values which were initially established.

$$X_j = \frac{x_j - x_{min}}{x_{max} - x_{min}} \qquad (3)$$

x_i – the effective value of the indicator;
x_{min}, x_{max} – the minimum and the maximum value, at national, regional or county level
When the indicator relives an unfavourable situation (a negative one) – the mortality rate, infant mortality rate and unemployment rate – the formula for calculating the individual indexes is as follows:

$$X_j = 1 - X_j^* \qquad (4)$$

Where X_j^* is calculated like we shown before (relation 2)
The values for the qualitative indicators will be "1" for favourable cases and "0" for the unfavourable ones.
For calculating the ISDL, must forward the next steps:

- minimum and maximum values (goalposts) are chosen for each underlying indicator;
- calculating the individual indices for each indicator;
- calculating, using the weighted average, the values for each component $(I)_j$ of the synthetic index;

Once the dimension indices have been calculated, determining the ISDL is straightforward. It is a simple average of five dimension indices:

$$ISDL = \frac{I_1 + I_2 + I_3 + I_4 + I_5}{5} \qquad (5)$$

Performance in each domain and for the synthetic index is expressed as a value between 0 and 1.
For an example, the calculation of the ISDL is illustrated in the Tabel 1 (conventional data).
Appling the formula, The Economy Index is:

$$I_1 = \frac{0,4 \cdot X_1 + 0,2 \cdot X_2 + 0,2 \cdot X_3 + 0,2 \cdot X_4}{4} \qquad (6)$$

Where,

$$X_1 = \frac{x_1 - x_{1min}}{x_{1max} - x_{1min}} = \frac{1240 - 100}{1900 - 100} = 0,633 \qquad (7)$$

$$X_2 = \frac{x_2 - x_{2min}}{x_{2max} - x_{2min}} = \frac{90,8 - 0}{100 - 0} = 0,908 \qquad (8)$$

$$X_3 = \frac{x_3 - x_{3min}}{x_{3max} - x_{3min}} = \frac{36,2 - 0}{100 - 0} = 0,362 \qquad (9)$$

$$X_4^* = \frac{x_4 - x_{4min}}{x_{4max} - x_{4min}} = \frac{5,2 - 0}{15 - 0} = 0,347 \qquad (10)$$

Tabel 1
The sustainable development index at local level

Indicators	Values			Indices
	Maximum	Minimum	Effective	
Public incomes per inhabitant (lei)	1900	100	1240	0,633
% Owns incomes in public incomes	100	0	90,8	0,908
Commercial companies per 1000 inhabitants – number	100	0	36,2	0,362
Unemployment rate -%	15	0	5,2	0,653
Economy Index (I_1)				0,638
Mortality rate - ‰	15	8	9,8	0,743
Infant mortality rate - ‰	12	0	6,5	0,458
Family doctors per 1000 inhabitants	5	0	0,5	0,100
Health Index (I_2)				0,511
Literacy rate - %	100	0	97,6	0,976
Enrolment rate for I form - %	100	0	89,3	0,893
Education Index (I_3)				0,935
% dwellings with current drinking water	100	0	60,0	0,600
% dwellings connected to sewerage system	100	0	10,0	0,100
% dwellings connected to public gas system	100	0	80,0	0,800
% dwellings with inside bathroom	100	0	45,0	0,450
Living condition Index (I_4)				0,488
There is garbage removal service?	1	0	1	1
There is a monitoring system of water quality?	1	0	0	0
There is a monitoring system of air quality?	1	0	0	0
There is an environment protection strategy?	1	0	1	1
Environment Index (I_5)				0,600
ISDL				**0,634**

Because X_4 (unemployment rate) relives an unfavourable situation, the individual index results from:

$$X_4 = 1 - X_4^* = 1 - 0{,}347 = 0{,}653 \qquad (11)$$

Finally, The Economy Index is:

$$I_1 = \frac{0{,}4 \cdot 0{,}633 + 0{,}2 \cdot 0{,}908 + 0{,}2 \cdot 0{,}362 + 0{,}2 \cdot 0{,}653}{4} = 0{,}638 \qquad 12)$$

In the same way are determined the others indices I_2, I_3, I_4, I_5 and the value for Sustainable Development Index at Local Level became:

$$ISDL = \frac{0{,}638 + 0{,}511 + 0{,}935 + 0{,}488 + 0{,}600}{5} = 0{,}634 \qquad (13)$$

We appreciate that the ISDL must be calculate at every five years, taken into account that some of information are difficult to obtain and some indicators have no significant modification on short term.

A problem which concerns the calculation of the proposed index, at least for Romania, is the lack of information at local level. The proposed index it's useful only if it's calculated for all the communities from a country, a region or at least from a county. It's also needs official information that has unitary methodology.

At the moment, in Romania, at local level, the indicators that we had included in the ISDL are not available from the same source of information.

Part of the indicators is calculated by the National Institute of Statistics, others are available to the local authorities and some of them do not exist but can be obtained by organizing a survey.

It's also need the maximum and the minimum values for each indicator, that can be establish by the National Institute of Statistics.

Even there are some problems that we've just exposed, the index of the sustainable development at local level (ISDL) can be easily calculated, with a minimum of effort, if it will be included in the research program of The National Institute of Statistics.

The index of sustainable development al local level presents a big interest for the local authorities and not only for them but for all the users of local information (researchers, students, economic agents etc.)

5 Conclusion

The start point of the paper was to the fact that the need to develop and use indicators of sustainable development is based on the approach that"you can only manage what you can measure".

The sustainable development is currently a challenge issue [13] for the local authorities, could also constitute a challenge for the executive, legislature and judiciary [14] and the lack of information in this domain, at this level, there is a real problem.

So, the paper emphasizes the necessity of the quantification of the sustainable development at local level, presenting the main reasons for that this quantification is necessary. There are also presented the possibilities of the quantification of the local sustainability, using the official data basis and the administrative sources.

In order to sustain the related issues we've presented the evolution of the system of indicators at local level in Romania, a case study on rural communities and an opinion inquiry.

We've tried to emphasize the importance of developing sustainability indicators used to measure progress in a sustainable community, both punctual

as well as synthetic indicators. We consider that good indicators at local level should:

- Be statistically and practically measurable in a geographical area;
- Reflect something basic and fundamental to the long-term economic, social or environmental, of a community;
- Be understood and accepted by the community.

That if why the proposed index was created taking into consideration these demands.

Even the synthetic indicators can't offer a complete image on the local development, if they are the result of a complex array of information, it can lead to correct conclusions about policy performance in sustainability domain.

References:

[1] World Commission on Environment and Development, Our common Future, Oxford, 1987

[2] Dollfus Etienne, Des outils aux systèmes: propositions méthodologiques pour articuler les indicateurs et complexité, *Centre d'écologie humaine et des sciences de l'environment*, Genève, 2006

[3] European Commission, EUROSTAT, Measuring progress towards a more sustainable Europe, Sustainable development indicators for the European Union, Luxembourg, 2005, page 10

[4] Boidin Bruno, Les tentatives de mesure multidimensionnelle du développement durable a l'échelle mondiale, *Journées Françaises de l'Evaluation*, 2003, pp. 6-7.

[5] Human Development Report 2006, Beyond Scarcity: Power, Poverty and the Global Water Crisis, *United Nation Development Programme*, 2006

[6] Bran Florina (and collectively), Quantizing of sustainable development, *Economical Publishing House*, Bucharest, 2006, pp. 36

[7] Gadrey Jean, De la croissance au développement: a la recherché d'indicateurs alternatifs, *Séminaire DARES, Paris*, 2002, pp. 19

[8] Robert Prescott-Allen, The Wellbeing of Nations, *Island Press and International Development Research Centre*, 2001.

[9] www.ecobilan.com/dossiers/fr/collectivites-developpement-durable.php

[10] Kuei-Yang Wu, Wann-Ming Wey, Wen-Zer Lin, Sustainable Community Management Evaluation Using Fuzzy Analytic Hierarchy Process in Miaoli city of Taiwan, *Proceedings of the 2006 IASME/WSEAS Int. Conf. on Energy, Environment, Ecosystems & Sustainable Development*, Greece, July 11-13, 2006 (pp 409-416)

[11] Lazar Cornel, Lazar Mirela, Proposal of a sustainable development synthetic indicator al local level, *Proceedings of the 9th WSEAS International Conference on Mathematics and Computers in Business and economics (MCBE'08)*, Bucharest, Romania, June 24-26, 2008 (pp74-78)

[12] Perret B., Indicateurs sociaux. Etat des lieux et perspectives, *Les Papiers du CERC*, Paris, 2002, p.27).

[13] Jehng-Jung Kao, Tze-Chin Pan, Chin-Min Lin, A Prototypical Environmental Sustainability Accounting System, *Proceedings of the 2006 IASME/WSEAS Int. Conf. on Energy, Environment, Ecosystems & Sustainable Development*, Greece, July 11-13, 2006 (pp 69-73)

[14] Alice Hatzopoulou, Stefanos Gerasimou, Sustainability and Public works, *Proceedings of the 3rd IASME/WSEAS Int. Conf. on Energy, Environment, Ecosystems and Sustainable Development, Agios Nikolaos*, Greece, July 24-26, 2007 (pp 452-455)