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ASSESSMENT TERMS FOR LOCAL SUSTAINABILITY MANAGEMENT

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Abstract
After the Conference for Environment in Stockholm in 1972 and after the release in the same year of the first report to the Club of Rome, „The Limits to Growth", was understood that the wish of increasing our life quality by using new technological applications could have beside desired effects, also undesired ones. Worldwide began debates on scientific, political and social levels in order to find solutions for these problems. The concept of sustainable development, defined for the first time 1987 in the Brundtland Report, largely discussed 1992 during the so-called "Rio"-Conference as well as 2012 during the "Rio+20"- Conference, was worldwide accepted as a possible solution for the global complex ecological, economic and social problems. On a local level best strategies have to be found for developing sustainable cities as well as most appropriate assessment terms. Newly debated strategies for sustainable urban development have at their base the concept of "Decoupling" firstly developed 2013 in the Club of Rome. Using new transportation possibilities, other than cars as well as rehabilitating residential urban buildings and constructing green buildings are as well in the discussions. These aspects are related to mindset changes and to a new type of education of the young generation, a so-called Holistic Education for Sustainable Development. Presently it is still not very clear what a sustainable city should be and what components should be included, getting a "general methodology" for sustainable cities represents a big progress in this field.

Keywords*: decoupling, dynamic assessment methods, general methodology, local sustainability, mindset changes*

Introduction

In the context of the desire to rise the human quality of life especially after the Second World War, tremendous technological developments have started to take place on a global level. The positive effects of the significant technological applications on the population quality of life were remarked due to their support in carrying out day by day activities. On the other side, the world began to simultaneously recognize the dangers and undesired effects of some human activities, not only of industrial ones, activities which have been carried out in order to develop many technological applications. At latest after the Conference for

Environment in Stockholm in 1972 and after publication in the same year of the first report to the Club of Rome „The Limits to Growth" was obviously understood that besides wanted and positive impacts of the technological progress, undesired and negative consequences can also occur (Meadows & Meadows 1972). Considering these evolutions it was clear already at that time that the arisen regional and global environmental problems are severe and need to be tackled, debated and solved. Humanity is currently confronting itself with several global problems, named by the Club of Rome as "World Problematique" (Meadows & Meadows 1972). This notion is containing several issues, most important among them being the following three ones, increase of natural resources and energy consumption, environmental pollution and increase of world population (Jischa 2014) (Figure 1).

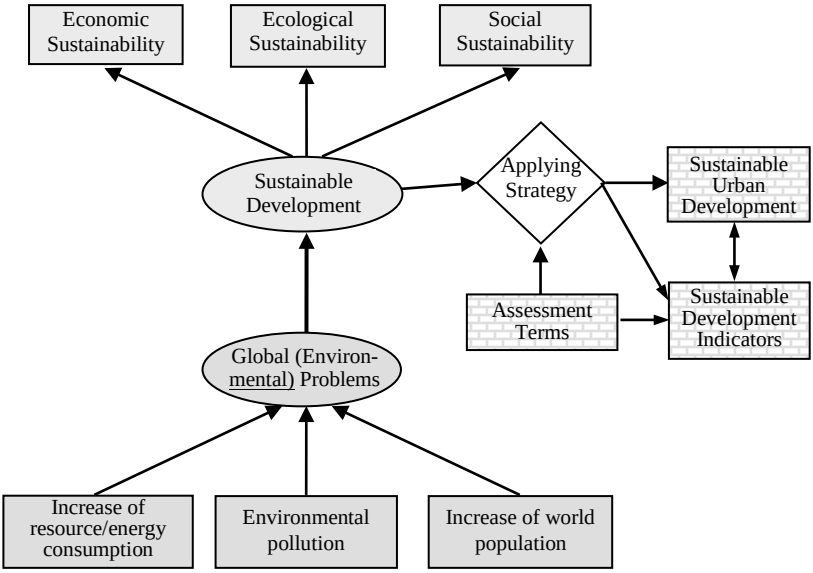

Figure 1. Sustainable Development applying strategy by Assessment Terms as a response to global (environmental) problems.

After recognising the complexity of the problems shown above with the goal of finding solutions which could be applicable in the same way to the developed as well as to the developing countries with respect to regional differences, worldwide began discussions some time ago on political, scientific and social levels (Tulbure 2003).

The Brundtland Report of the World Council on Environment and Development, published 1987, represented a result of these worldwide socio-political discussions,

where for the first time the concept of sustainable development was defined (Hauff 1987). This concept has been nevertheless soon accepted as a possible solution for the much debated global complex ecological, economic, and social problems (Jischa 2014). The concept of sustainable development was very much discussed thereafter, as for instance in 1992 on the Conference for Environment and Development in Rio de Janeiro, being strongly emphasized in the conference closing document Agenda 21, as well as 2002 in the follow-up Conference Rio+10 in Johannesburg, Southern Africa and 2012 during the Conference Rio+20 in Rio de Janeiro (Tulbure & Prunariu 2017). Many actions after this time have emphasized that the evolution of the pretty complex technical, social and environmental systems has to be analysed in synergetic relation (Jischa 2014).

Materials and Methods

Concretely applying sustainable development on a local level, i.e. its operationalisation means the translation of its goals into political measures and controlling instruments (Jischa 2014, Lengsfeld et al 2003). In this regard, by applying the sustainability systemic analysis on a local level, the general methodology for sustainable urbanisation can be obtained, which is materialised in the following steps (Tulbure 2016):

- defining the sustainability problem on a local level;
- establishing specific space and time scales;
- systemic approach of the analysed city by modelling the interactions;
- establishing concrete aims for the studied case by establishing priorities;
- developing assessment terms and controlling instruments;
- verifying possible results, which could be obtained after introducing the proposed measures by developing scenarios for sustainable urbanisation;
- applying into practice the developed concept.

The operationalisation is only possible, when for an individual problem-case concrete aims are established and from these aims concepts to achieve them are developed. Sustainability is to be newly defined for each different case, where space and time scales are to be established (Banse et al 2011).

As a possible solution for the challenges concerning sustainability, as environmental pollution and recognized rebound-effects, the term of Decoupling has been emphasised first time by the Club of Rome during its conference in Zürich, Switzerland, in the time 15-16.10.2015 (Tulbure 2016). It is actually a response to the multitude of global problems recognised and debated already 1972 in the first report to the Club of Rome, "Limits to Growth" and is meaning to break the long held causal relationship between economic growth and growth in the consumption of natural resources. The goal is to maintain the same life quality by decreasing resource consumption, to have less environmental impact, and to avoid rebound-effects by mindset changes. Improving the rate of resource productivity ("doing more with less") faster than the economic growth rate is the key notion behind Decoupling. This means that in order to materialise Decoupling there is a need of innovations in technical field, but in the same time a need of changes in social field,

i.e. changes in human behavior as well as mindset changes (Jischa 2014). In this regard the holistic education receives an important role, beside other inter-related aspects as economic development, appropriate local infrastructure, environmental protection, cultural life, in the context of getting local sustainability (Banse et al 2011, Tulbure 2013). On the other side the field of developing future energy systems is nowadays very much debated on different levels. The present discussions regarding existing strategies on regional level for gaining best future energy systems are led with the main goal of avoiding climate change (Parodi et al 2010).

From the made presentation it is obvious that for Managing Local Sustainability in a proper way, there is a need for defining specific Sustainability Assessment Terms. Part of what engineers do is to assess developments in technology. Their evaluation has up to now almost without exception been focused on technical aspects, like functionality and safety, and on economic aspects following legal and financial boundary conditions (Jischa 2014). With respect to local sustainability management specific assessment terms have to consider more criteria like: environmental quality, social and human values, quality of life (Tulbure 2016). This assessment way needs interdisciplinary cooperation (Parodi et al 2010, Tulbure 2016). In order to support engineer activities when evaluating technologies a new discipline has been developed, appeared firstly in the USA, i.e. Technology Assessment (TA) (Grunwald 2010, Tulbure 2013, Jischa 2014).

On the global level the operationalisation of sustainable development means to define general goals for the whole world, things which happened more or less 1992 with the "Rio"- Conferences, 1997 with the well-known "Kyoto"-Protocol and much debated 2012 during the "Rio+20"- Conference. On a national level this means to define goals and to elaborate strategies by paying attention to the specific conditions of a country, as usually national conditions are very specific and different from one country to another one (Tulbure 2016). This aspect is especially to be remarked for the social and cultural field, where national particularities can be very specific (Banse et al 2011). On a local level concrete measures are representing the content of Local Agendas 21 (City Council 2011).

Regarding the methodological side concerning urban sustainability the field of applying sustainable development on a local level does represent a pretty young direction for some countries in South Eastern Europe (Banse et al 2011, Tulbure & Prunariu 2017). An appropriate way for developing strategies for urban sustainability could be represented by using analytical instruments of Technology Assessment, because very often the questions are regarding the possibilities to best integrate new technologies on a local level into environment and society (Tulbure 2013). These questions are in the present conditions of Eastern European countries from dominant importance, in the process of modernisation of old technologies and implementation of new ones. From this reason Technology Assessment should play a central role in the next technological, economic, environmental and social development of these countries (Grunwald 2010, Tulbure 2013). Going into details, the vision of getting sustainable cities, by taking into account regional differences, is

worldwide a pretty discussed topic, but has started to be debated also in some Eastern European countries (Banse et al 2011, Tulbure & Prunariu 2017).
In order to get in the future sustainable cities in Romania debates on scientific level have already started, regarding establishing a general methodology for developing sustainable cities, in accordance to the already applied methodologies in other European countries by taking into consideration specific regional differences especially on social and cultural level (Banse et al 2011, City Council 2011).
When analysing the above presented methodology for sustainable urbanisation one can recognise that the urban sustainability means actually a transformation process under changeable frame conditions (City Council 2011, Tulbure 2016). The so-called Local Sustainability Management, as presented in Figure 2, means actually to emphasise the development direction on a local level. This is possible to be done by simultaneously considering economic, environmental and social aspects and by representing them on the axis, as shown in Figure 2, by using relevant indicators for each considered aspect. The evaluation of the development path is possible, if desired (D) and undesired (U) ranges are defined for each considered aspect. If the development is situated in the so-called „sustainable action range", this means that Local Sustainability will be assured. If the development is situated in the so-called „unsustainable range", the vision is to make corrections of development by introducing some measures. It follows that Local Sustainability Management means developing and applying local strategies, not only in technological or economic fields, but also in environmental and social ones. Such sustainability strategies have to be evaluated by considering specific sustainability requirements, which are more or less dynamic ones (Tulbure 2016).

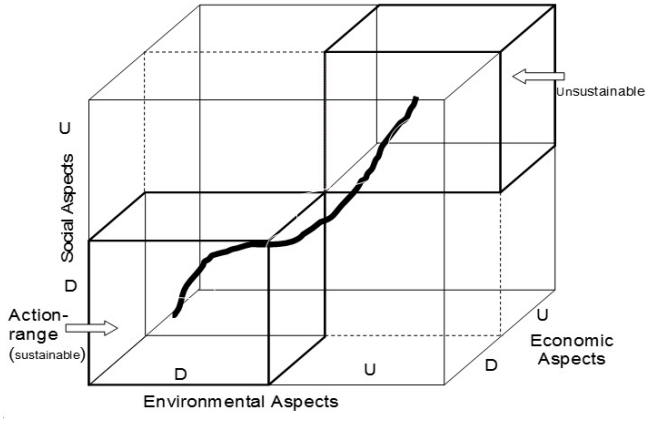

Figure 2. Local Sustainability Management

This means that Sustainability Assessment on a local level is a pretty difficult issue, because comprehensive evaluation criteria cannot be defined for each field, as for instance for the social field, because it is not possible to define „limit values" in this field. And in the field of Sustainable Development all three fields of Sustainable Development have to be taken into account, economic, environmental and social one. And for some fields there are no strict numbers, which could be interpreted as "sustainability reference numbers" and used as reference values, in order to make comparisons. In this case development tendencies are to be evaluated by using so-called Dynamic Assessment Methods, DAM for Local Sustainability Management. In this way it is possible to highlight if a certain developing path is in accordance with the sustainable path on a local level (Tulbure 2013). The presented methodology is generally to be applied on a local level, but special attention is to be paid to following difficulties (Jischa 2014):

- Considered processes can be complex and uncertain;
- There is a need to handle quantitative as well as qualitative aspects, that should be integrated into the analysis;
- There is a need to design indicators for urban sustainability, in order to succeed evaluating the development direction at a certain time.

Results and Discussion

After joining the European Union in 2007, the word "sustainability" started to be heard more frequently in Romania. Since then small steps have been taken, sometimes because of bureaucracy, sometimes because of other priorities, and sometimes because of lack of knowledge. Nevertheless it has to be mentioned that in the last years some progress has been registered in the field of sustainable urban development and local sustainability management (City Council 2011).

In order to emphasise this development, beside Sibiu, selected 2007 to become the European Cultural City, the five biggest cities in Romania will be considered: Bucharest, Cluj-Napoca, Timisoara, Iasi and Constanta. In order to become sustainable cities, they all share some things in common (City Council 2011):

- need for urban regeneration;
- need to reduce energy consumption;
- use of new transportation possibilities, other than cars.

On the other side, the Romanian Government approved in the year 2009 a program for the rehabilitation of residential urban buildings constructed from 1950–1990. Also the idea of constructing green buildings has very much come into discussions, as for instance in the city of Cluj-Napoca. This city has had first in Romania a "Green School", built-up in 2012. In this context, starting with 2013, the construction of green buildings has been encouraged by Romanian local authorities, for instance by reducing local taxes for them by 50% (City Council 2011). Nowadays there are discussions also in the field of assuring alternative transportation possibilities. The population in several cities did agree that bicycles will need to be used more frequently. The largest bike-sharing project in the country was launched 2010 in Bucharest, followed 2011 by Cluj-Napoca and Constanta as

well as 2012 by Timisoara. Each city is hoping that this initiative will help reducing their carbon footprint and sustain the development of an adequate infrastructure for cyclists (City Council 2011). Another newly discussed strategy is based on the usage of bio-energies and biotechnologies, in order to establish future sustainable energy strategies for sustainable urban development (Jischa 2014, Tulbure 2016).

By aapplying Dynamic Assessment Methods it is possible to evaluate the degree of assuring urban sustainability in the analysed region. For this goal postulates started recently to be defined, after FFRC, Finland Futures Research Centre, so-called Sustainability-Postulates should be considered. For instance it can be postulated that Sustainability cannot be achieved without respecting following assessment terms (Jischa 2014):

- Postulate P1: A decrease of Environmental Pollution (EP): $D(EP) < 0$
- Postulate P2: A decrease of (at least keeping constant) the Energy Consumption (EC): $D(EC) \leq 0$
- Postulate P3: An increase of the Life Quality (LQ): $D(LQ) > 0$

In order to exemplify a case for local sustainability management in Romania the Alba Iulia Association for Intercommunity Development, AIDA will be considered. This association of 11 local administrative units (3 urban and 8 rural communities) represents the interests of more than 120000 inhabitants and has the goal to get the desired socio-economic development, based on specific actions (City Council 2011). The most important city of the association is Alba Iulia, having about 66000 inhabitants, a city which constitutes a hystorical symbol for Romania. The city Alba Iulia has a Development Strategy that aims to acknowledge urban mechanisms as a positive force in improving housing standards, equity and sustainability standards.

The Strategic Development Plan is to address issues related to improving the quality of pedestrian areas and of all public space areas and also to improve the accessibility in the historical part of the city, this is the Fortress Area, which is pretty relevant for the History of Romania. The environmental policy of Alba Iulia is also targeting transport issues, as the tourism activities are pretty developed in this city. The Association AIDA has several Strategic Objectives, as emphasized below, with the vision of improving all human life aspects in this region (City Council 2011):

1. Developing the local and regional infrastructure;
2. Economic progress by developing new jobs;
3. Promotion of the so-called "green energies";
4. Promotion of the local cultural values as well as of traditions;
5. Improving the educational, social and health infrastructure;
6. Building partnerships, as well as national or international cooperation's.

Going into details, these Strategic Objectives are in the same line with the debated Sustainability-Postulates P1, P2, P3, by using the Dynamic Assessment Methods (Tulbure 2016).

In the mentioned strategy of the association AIDA several aspects are pointed out, as being necessary for the future sustainability of this region (City Council 2011), as

the need of Transnational Cooperation, of Holistic Education for Urban Sustainability, and establishing requirements for Sustainable Urban Development of Alba Iulia.

Conclusions

Nowadays there is no agreement regarding general requirements for local sustainability management or there is no complete agreement regarding what components should be included. Generally there is agreement that a sustainable city should meet the needs of the present without compromising the ability of future generations to meet their own needs. The ambiguity within this idea leads to variations in terms of how cities carry out their attempts to become sustainable. However, a sustainable city should be able to feed itself with minimal reliance on surrounding countryside, and to power itself with renewable energy sources. The goal is to generally promote sustainable urban development, by taking into account all aspects related to this issue such as technical-economic, social and environmental aspects in the field of adequate living conditions and housing space, proper resource use, mobility, governance as well as of social life. This means that there is a real need for interdisciplinary work among economists, engineers with social scientists. Developing a kind of a "general methodology" to be applied into the practice for real concrete situations by taking into consideration regional differences is representing a major progress in this field, just to come from the vision to the reality. To achieve this main goal in the field of asuring a sustainable urban development it is useful that Romanian cities become partners in European networks of sustainable cities in order to successfully cooperate in this field. On the other side the desire is to find appropriate ways to establish best strategies for local sustainability in Romania, as proposed in the paper by the methodology for local sustasinability management.

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