

## LAND MANAGEMENT FOR SUSTAINABLE DEVELOPMENT

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**Abstract:** *Land management is representing an inter- and transdisciplinary activity, which is using knowledge from several disciplines. In this paper some principles and criteria for Sustainable Land Management will be emphasized in the context of the concerns for assuring the sustainability on a regional level. Sustainability can be achieved only by considering a proper management and administration of resources. This means that actually farmers and local decision makers have to be encouraged in recognizing the advantages of good land use planning and decisions, but also to be held responsible for inappropriate land uses, that can compromise the sustainable development of our human society. Conclusions will be drawn regarding the existing possibilities of assuring a sustainable land management related to land use planning and administration on a regional level.*

**Keywords:** *Land Administration, Land Management, Sustainable Development, Integration Process*

### 1. Introduction regarding Land Management

Regarding assuring the sustainability of our human society, besides environmental aspects by assuring the technical infrastructure for the appropriate economic growth, social and cultural aspects are relevant to be taken into account. In the last time in the sustainability literature different issues regarding an appropriate land administration and management have been strongly mentioned in this context [11].

The already known principles and criteria for Sustainable Land Management and Administration have to be mentioned with the wish of assuring the sustainability on a regional level. For this goal a proper management and administration of resources has to be assured. In this regard there is a need to recognize the advantages of good land use planning, that encourages the idea to support farmers and local decision makers to discover and to apply methods for assuring a sustainable land management on a regional level [8].

In this context both basic understanding of the phenomenon, as well as practical skills in handling respective problems, are needed at the same time [7]. Land administration and management need a comprehensive theoretical framework, using theoretical contributions from law and economics, as well as from various social sciences.

Land administration is representing the process of determining, recording and disseminating information about the ownership, value and land use. Land management is integrating the coordination of land resources use and development in both urban and rural settings. Nowadays with different occasions the integration possibilities of land administration and management in a sustainable way are emphasized [11].

Land, and the interaction of human societies with it, has resulted in many economic, social, political and environmental outcomes and concerns. The dialogue between these competing and overlapping factors requires a land administration system that is able to support the ever changing relationship between humankind and land, to facilitate complex decision making and to support the implementation of those decisions. Therefore, appropriate and effective land administration is of crucial importance for sustainable development [11].

Current land administration systems are actually products of the 19<sup>th</sup> century paradigms of land markets. They have awfully failed to properly support sustainable development. This failure is evident world-wide by the ever increasing pressure on water allocation and development rights, to high levels of poverty, restricted access to land, lack of security of tenure and continued environmental degradation and pollution [10]. The need for urgent reform has been accepted, unclear until now has still remained the way forward [7]. Initiatives to develop a clearer perception to identify the relevance of land administration to sustainable development have been explored by the International Federation of Surveyors (FIG), which has been concerned also regarding land administration issues [11].

On a global level it is already recognised the breadth of cadastres and their important role in land administration systems, but at the same time it is playing an important role by focusing on land registration and cadastral surveying and mapping.

Land management is an activity that is directed to integrate the coordination of land resources use and development in both urban and rural settings. It is very clear that land resources are used in order to achieve different goals of human activities. In this regard several domains could be mentioned which are including agriculture, water resource management, reforestation, as well as habitation facilities. Also different projects in the field of eco-tourism could take an important part regarding land management [8].

Sustainable land management refers to practices and technologies that have the goal to try integrating land and water management, biodiversity as well as other environmental resources to meet human needs while ensuring the ecosystems sustainability. The term sustainable land management is used in the context of regional planning, of soil and environmental protection, as well as of property management [1].

After publishing the first report to the Club of Rome „The Limits to Growth“ 1972 it was at the latest understood that besides wanted effects of new scientific developments, undesired negative effects on humanity and environment can appear [6]. The concept of sustainable development, defined first time 1987 in the Brundtland-Report and accepted as a possible solution for the complex global problems, is requiring multi-criteria decision making processes. The reason is represented by the vast knowledge from several fields that has to be considered, as from technological, environmental, economic, social ones, including aspects related to proper land management and administration [2, 5].

## **2. Integrated Land Administration and Management**

Land administration and management, as professional activities in society, but even more as academic subjects, i.e. as elements in educational programmes and as themes for research, need a comprehensive theoretical framework, which is allowing to draw on theoretical contributions in law and economics, as well as various social sciences [8], Land administration is the processes of determining, recording and disseminating information about the ownership, value and use of land when implementing land management policies.

In the last time new concepts of soil and land quality are emerging, and often these are used interchangeably. These concepts and their relationships are used to get consensus on the fact how these concepts should be concretely applied into the real situations [1].

On an international level Land Administration is defined as being the processes of determining, recording and disseminating information about the ownership, value and use of land when implementing land management policies [3].

When the issue of land administration is debated, in almost all of the situations the discussion is going in the direction of debating Land Registration, which does represent the process of recording rights in land either in the form of registration of deeds or the registration of title to land [3].

On the other side Land Management does represent the totality of activities that are associated with the management of land as a resource from an environmental as well as from an economic perspective towards sustainable development [3]. Important components of land management are represented from a professional point of view by the land consolidation and land readjustment, as it is often called, when is applied in urban areas [8].

When performing land administration and land management there are several activities that have to be carried out, expressed in active, verbal terms. The most important activities in this regard are the following ones [8]:

- Observing, classifying, recording and disseminating information;
- Clarifying obscure titles, rights as well as boundaries;
- Analysing situations concerning land, rights, values, constraints, and opportunities, with the goal of coming up with practical solutions for improvements;
- Solving conflicts by negotiations, mediation and by passing of formal judgements with legal power;
- Valuation of land, rights and resources in a wide variety of situations; ordinary transactions, land consolidation, readjustment, expropriation of private property as well as taxation;
- Creating new property units, both in a physical and a legal sense.

### **3. The Concept of Sustainable Development**

After the Conference for Environment in Stockholm in 1972 and the first report of the Club of Rome „The Limits of the Growth“ in 1972 [6] was understood that besides wanted effects of technological progress, undesired and negative effects can appear. Nowadays we confront us with a series of global problems, which can be grouped in three categories: world population growth, growth of the energy and natural resources consumption and environmental pollution [6], as presented in Figure 1. They can be called "old" problems. Other issues have arisen in the last years and they can be called "new" global problems. For instance issues related to the use of ICTs and their impacts as well as the use and impacts of biotechnologies can be mentioned in this category [5].

In the Brundtland Report for the first time the concept of *sustainable development* has been defined and accepted as a possible solution for the global complex ecological, economical and social problems [12]. This concept was very large discussed on the Conference for Environment and Development in Rio de Janeiro 1992 as well as approached in the closing document „Agenda 21“ and during the Johannesburg Conference in 2002. Many actions after this time emphasise that the evolution of technical, social and ecological systems has to be analysed in synergetic relation [9]. The general Brundtland definition was worldwide accepted, but alone does not deliver a concept, that can be applied to the real concrete situations.

The operationalisation of the concept of sustainable development means the transformation or translation of its goals in political measures and controlling instruments. A

general methodology in order to operationalise sustainable development can be materialized in the following steps [9]:

- defining the sustainability problem;
- establishing the space and time scales;
- systemic approach of the region by modelling the interactions;
- establishing concrete aims for the studied case;
- developing concepts and measures by establishing priorities;
- developing evaluation and control instruments, indicators;
- verifying the possible results, which could be obtained after introducing the proposed measures, comparing different scenarios;
- applying in the 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 the system modelling approach does play a relevant role [9], as it is emphasized in Figure 1.

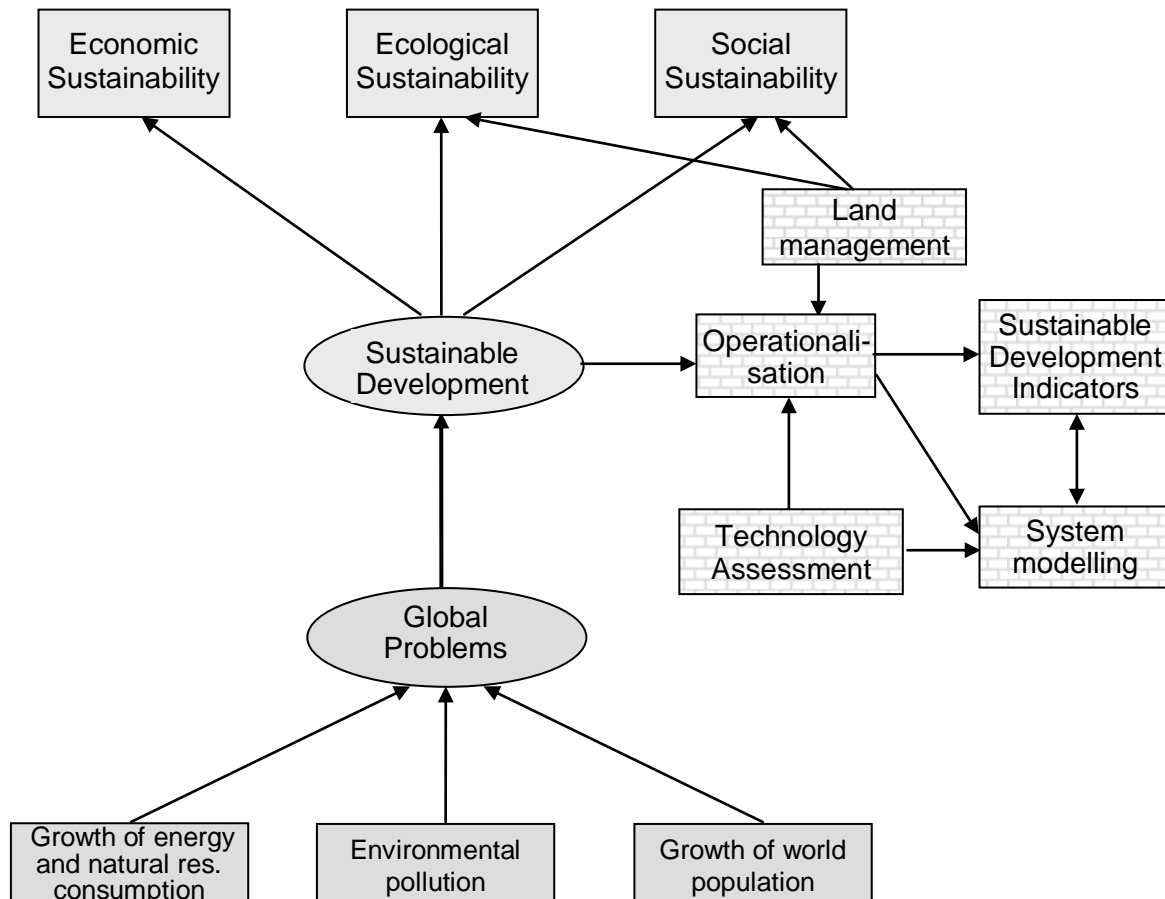


Fig.1. Global problems and the concept of sustainable development.

Evaluation and control instruments are important in this context, just to be able to control the developments in a certain time, if these developments are in the wanted direction

or not. Such evaluation and control instruments can be defined on local, regional or national level, depending on the intended goal regarding sustainable development. In this regard such evaluation and control instruments are called sustainable development indicators (SDI), as emphasized in Figure 1. These indicators permit to formulate quantitatively the proposed objectives and goals for sustainable development. After introducing the proposed measures, the realization degree can be controlled and verified by calculating these indicators and by comparing to the reference values. The possibility to make corrections is assured in this way. On the other hand indicators serve as an instrument which helps to better understand the possible effects by introducing certain measures and to inform the public [4].

In the last time there is consent among political economists and engineers that the gross national product does not represent a measure for the life quality of a nation. It gives information about national economies, but it does not consider many parameters which influence the life quality, as for instance: environmental pollution, irreversible use of fossil fuels, social aspects etc. That is why new indicators have to be developed on each level.

Part of what engineers do is to evaluate developments in technology. Their evaluation has up to now almost without exception been focused on technical aspects and on economic aspects following legal and financial boundary conditions. With respect to sustainability more criteria have to be considered like: environmental quality, social and human values, quality of life. The activities of engineers when evaluating technologies can be sustained by the new discipline called technology assessment (TA), which is used also for operationalisation of sustainable development, as presented in Figure 1 [9].

Although in the last 20 years it was a lot of progress in the field of technology assessment especially due to several studies which have been carried out in USA, Japan, Germany and other European countries, there is still need in developing integrative methods for technology assessment [4].

#### **4. Land Administration for Sustainable Development**

World opinion on aspects of sustainable development, as represented by the UN Global Summits and Declarations, has recognised the importance of land administration to support sustainable development, but has provided few practical implementation strategies. This ad-hoc approach has resulted in a certain amount of rhetoric in developing land administration systems to accommodate sustainable development objectives [2].

However, in a time when governments have proved willing to reform land administration systems for sustainable objectives, there are no clear directions or models to adopt in this regard. In simple terms, a new land administration and management paradigm is required if the concept of sustainable development will also be applied in this field.

Fortunately, there has been a growing awareness of these issues and, as a result, world attitudes are changing. Nations are now generally more conscious of the fact that the actions of individuals can have global consequences. This awareness has arisen as a result of the greater availability of information. This in turn has re-ignited the debate about how land can best be administered for the good, not only of individual landowners and users, but also for the community as a whole. The imperative to re-examine land administration systems in the context of sustainable development is now overwhelming [11].

The world's nations have committed themselves to a global agenda addressing a range of matters pertaining to sustainable development and these include many of the concerns outlined earlier. These and other problems have been addressed through major international conferences such as the Conference on Environment and Development held in Rio de Janeiro in 1992. Agenda 21, an outcome of that Conference, has been re-affirmed in the subsequent

international fora such as the Social Conference in Copenhagen, the Population Conference in Cairo, the Women's Conference in Beijing, the HABITAT II Conference held in Istanbul in 1995 that resulted in the Habitat Agenda, and the World Food Summit in Rome in 1996 resulting in the Food for All Campaign [11].

In order to review the contribution of land administration and land tenure to these international issues, the UN and the FIG agreed to cooperate on a number of initiatives [3]. As a result of a resolution at the United Nations Regional Cartographic Conference for Asia and the Pacific in Beijing in 1994, a joint UN-FIG meeting of experts on cadastral reform was held in Bogor, Indonesia in 1996. The resultant 1996 Bogor Declaration on Cadastral Reform widened the focus to concentrate on cadastral issues and land markets and recognised that although each country has different needs and is at a different state in the development of the relationship between its people and their land, there is much benefit in exchanging ideas and experiences. By examining solutions in other countries one can achieve a better understanding of the problems in one's own region.

Arising from the Bogor Declaration, a resolution was passed at the 14th United Nations Regional Cartographic Conference for Asia and the Pacific, held in Bangkok in 1997. It urged the United Nations, in collaboration with the International Federation of Surveyors (FIG), to hold a Global Workshop on Land Tenure and Cadastral Infrastructures in support of Sustainable Development ("the Bathurst Workshop"). The proposed workshop was also referred to in Resolutions of the United Nations Regional Cartographic Conference for the Americas held in New York in 1997 [11].

## **5. Integrated Sustainable Land Administration and Management**

The idea of getting the sustainable development of a certain region relates to simultaneously take into consideration the developments in economic, environmental and social field in the approached region. For this goal also the basic framework for land administration systems all over the world shall be approached, which forms the bottom line for economic, social and environmental development, as well as good governance. This in no doubt is the basic philosophy of the transformation agenda of the present administration. However, efficient socio-economic development and good governance requires judicious planning, design and implementation, as well as rational use of land and its resources [11]. Hence, the need for maps and map substitutes is indispensable in this regards. Furthermore, Land Administration Systems are the basis for conceptualizing rights, restrictions and responsibilities related to people, policies and places. Property rights are normally concerned with ownership and tenure, whereas restrictions usually control use and activities on land; responsibilities relate more to a social, ethical commitment or attitude to environmental sustainability and good husbandry [8].

Sustainable Land Management is the knowledge-based procedure that helps integrate land, water, biodiversity, and environmental management (including input and output externalities) to meet rising food and fiber demands while sustaining ecosystem services and livelihoods. The concern of the Sustainable Land Management is to meet the requirements of a growing population all over the world. Improper land management can lead to land degradation and a significant reduction in the productive and service functions of watersheds and landscapes.

Land management is the process by which the land resources are used in order to get the wished results. It covers all activities concerned with the management of land as a resource both from an environmental and from an economic perspective. It can include

farming, mineral extraction, property and estate management, and the physical planning of towns and the countryside [8].

In order to achieve an Integrated Sustainable Land Administration and Management it is important to take into consideration all human economic activities, industrial and agricultural ones, but also to consider a proper Housing and Land Management [2].

In this context it is important to promote

- energy efficient and adequate housing, including for those with special needs and vulnerable population groups;
- compact, inclusive, resilient, smart and sustainable cities;
- transparent and efficient land use, and property registration.

There is a need to have so-called *key policy documents on housing and urban development*, including documents on sustainable housing as well as on land administration and management. There is a need to better focus on strategies to develop better land management systems by improving cadastre and land registry systems by considering the sustainability principles. This is to be achieved by conducting in-depth research into land management issues connected with the sustainability concern. Recent studies include the challenge of modernizing land administration systems by considering sustainability approaches [2].

The Working Party on Land Administration (WPLA) is an intergovernmental group of experts and policy officials from UNECE member countries, working to improve land administration and management through activities based on cooperation and exchange of experiences regarding sustainability issues. The WPLA promotes the establishment of secure tenure, the improvement and creation of more effective land registries, the correlation with sustainable development goals and the use of sustainable land use policies [2]. From this work a lot of ideas and concepts can be got and applied on regional and national level in order to try getting at the end an Integrated Sustainable Land Administration and Management.

## 6. Conclusions

In the present paper the ideas and concerns regarding sustainable land use planning, administration and management have been presented. The sustainable land management is indispensable for the proper economic and social development. It is also vital for good governance, assuring in this way the proper development of our human society. Local decision makers have to strongly recognize in the future the advantages of good land use planning, administration and management, in order to take proper decisions in the direction of assuring the sustainability of the rural and urban development, as first conditions in this direction. On the other side there is a need to take the responsibilities for inappropriate land uses, because this can really compromise the sustainable development of our human society. As a general conclusion that can be drawn regarding these aspects, it follows that the existing possibilities of assuring a sustainable land management on a regional level have to be better explored in the efforts of establishing the sustainable development of our society.

## 7. References

1. CIPRA International, 2014: *Biodiversitaet und Nachhaltige Raumnutzung im Alpenrheintal - Übersicht zum Stand der Dinge*. Government of Liechtenstein, [http://www.greenalps-project.eu/wp-content/uploads/2013/10/140910\\_BerichtStandDerDingeBiodivAlpenrheintal.pdf](http://www.greenalps-project.eu/wp-content/uploads/2013/10/140910_BerichtStandDerDingeBiodivAlpenrheintal.pdf)

2. *Enemark, S., 2007: Integrated Land-Use Management for Sustainable Development. International Federation of Surveyors, April 2007*
3. *FIG 1999: Draft Glossary for UN-FIG Declaration*
4. *Jischa, M. F., 2005: Herausforderung Zukunft, second edition, Elsevier, Spektrum Akademischer Verlag, Heidelberg.*
5. *Lengsfeld T., Tulbure I., Ali V. (Eds.), 2003: Exploring a worthwhile future for all. - A report of tt30 of the Club of Rome. Spanish Chapter of the Club of Rome, Valencia, Spain*
6. *Meadows, D. and D., 1972: The Limits to Growth; Universe Book, New York.*
7. *Palamariu, M., Tulbure, I., 2010: Considerations on the Evolution of Cadastre in Romania. In: Proceedings of the 10th International Multidisciplinary Scientific Geoconference SGEM2010, 20-26.06.2010, Vol. 1, pag.: 987-994, Albena, Bulgaria.*
8. *Sevatdal, H., 2002: Land Administration and Land Management: An Institutional Approach. FIG XXII International Congress Washington, D.C. USA April 19-26 2002*
9. *Tulbure, I., 2003: Integrative Modellierung zur Beschreibung von Transformationsprozessen. Habilitationsschrift, TU Clausthal. VDI-Fortschrittsberichte, Reihe 16, Nr. 154, VDI-Verlag, Düsseldorf.*
10. *Tulbure, I., Palamariu, M., 2010: Environmental Assessment of Some Mining based Industrial Activities. In: Proceedings of the 10th International Multidisciplinary Scientific Geoconference SGEM2010, 20-26.06.2010, Vol. 2, pag.: 237-244, Albena, Bulgarien.*
11. *Williamson, I., Grant, D., 2002: United Nations – FIG Bathurst Declaration on Land Administration for Sustainable Development: Development and Impact. FIG XXII International Congress, Land Administration for the New Millenium, Washington, D.C. USA, April 19-26 2002*
12. *World Commission, 1987: Our Common Future, The Brundtland Report to the World Commission on Environment and Development; Oxford Univ. Press, Oxford, 1987.*