

"LIFELONG LEARNING FOR UNDERSTANDING SOIL AND LANDUSE SYSTEMS"

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Motto:
Treat the earth well:
It was not given to you by your parents,
It was loaned to you by your children.
We do not inherit the Earth from our Ancestors
We borrow it from our children.

Ancient Indian Proverb

Abstract

Our common soils are 'per excellence' very important for sustainable development, ever since the World Summit for Environment and Development in Rio de Janeiro in 1992, where Agenda 21 was adopted and the Framework Convention on Climate Change was signed. The trend towards uncontrolled sealed surfaces and damage of an asset that is extremely short and cannot be reproduced, is continuing. The targeted reduction in the growth rate of permanently sealed surfaces is to be achieved by looking for concrete measures and solutions.

The aim of this project is to co-operate in the development of measures against uncontrolled sealing and damage of soil and land. We are working on concepts for solving these complex problems in cooperation with graduate students and Ph.D. students from nine Danubian countries (DE, AT, HU, SK, CZ, BG, SI, YU, UA) and also representatives of science and political administration in the Neusiedlersee region. The project was organised in three parts. First, the impact of the threats related to soil and land-use were analyzed and actual trends in land-use were described. Secondly, targeted projects of applied research for the multifunctional management of soil and land were elaborated. Finally, we will initiate specific actions for policy support, to integrate the 'Thematic strategy for soil protection' from the DG Environment of the European Commission into an empowering dialogue on a regional basis. The result of this process will be a development concept as a starting point for a 'learning region' in the Danubian area. This means, we have to create awareness among all the stakeholders in the region for a responsible use of soils and land, and by learning from each other.

A. INTRODUCTION

Europe has become a giant freewheeling experimental laboratory for rethinking human conditions and reconfiguring human institutions in the global era. [Rifkin, p. 83] Sustainable development over unlimited material growth means to protect the interests of those who will come later, because we have loaned the land from our children. Within this relationship the programme **Ecologisation** of the Danube region offers the chance to realize a transdisciplinary approach between social, economic, technological and human sciences, implementing it within political-administrative systems. Ecologisation means to establish sustainable development issues as a

progressive task on all political levels. The ecologisation of the social development means to introduce principles of ecology, environmental protection and education into all areas of social importance. [Kvarda] An elaboration of strategies for improving cooperation of city councils and universities will be established to improve regional development, responsible use of soil and land use and integrated land utilisation issues along the Danube river.

Space is an asset that is extremely limited and

cannot be reproduced, and which has always been the subject of strong conflicts with regard to its utilisation. Responsible use of space with a democratic balance of interests must stop the trend towards uncontrolled urban sprawl and permanent sealing of surfaces. [Lebensministerium, p.70] European soils are under pressure by non-sustainable land use practices. Understanding the varying properties of the soil (and water) systems in space and time that determine the opportunities for more eco-efficient land uses is essential for future integrated resource management policies.

A growing population and an increasing energy consumption, transport and agricultural activities, linked to **pressures** such as global climate variability and warming are adding increasing pressure on the reserve of natural resources in general and especially on the soil environment. Through sealing alone, Europe loses several square kilometres of fertile land every day. As a follow-up to the EU Communication, the European Commission, DG Environment, decided to formulate a 'Thematic Strategy for Soil Protection' (COM(2002)179final). [Blum et al.] The soil has to become the common concern primarily within local/regional communities but also within state public enterprises and offices. [Stojkov]

B. BACKGROUND AND QUESTIONS

The Centre of Environmental Studies and Nature Conservation (ZUN) in cooperation with the Institute of Soil Research (IBF) at the University of Natural Resources and Applied Life Sciences in Vienna –**BOKU**, were submitting a project proposal to the EU in March 2004 as an Intensive Programme within ERASMUS1 called "Responsible Use of Soil and Land and Regional Development."

For the first time we will transfer operational goals and objectives for soil protection on the basis of the 'EU soil communication': "Towards a **thematic strategy for soil protection**" – COM (2002, 179 Brussels) in one of the European regions. Within this strategy the objectives of our endeavours are explicitly mentioned, in particular the eight threats to soil. Aspired goals for sustainable land-use and soil protection are harmonising different demands of land-use balancing them on a social and economic basis as well as on a scientific – technological one, all this in view of future generations.



Fig.1 Prof. Tomaz Pruz presenting 'Land use ethics'

The **aim** of the Erasmus Program is to increase the quality of Higher Education in Europe to achieve an increase in student and staff mobility and to promote inter-institutional co-operation. These cooperations are designed to reduce cultural barriers between the European states and to promote the building of a common European Education space. The Intensive Program (**IP**) "Responsible Use of Soil and Land and Regional Development" (IPSOIL) is a study program which brings together, from 2004 to 2007, students and staff members from universities of 9 participating Danubian countries.

The **goals** of this IP are to work out a common vision and to co-operate in the development of measures against uncontrolled sealing and damage of soil and land, aiming at a balanced production and also developing concrete measures for integrated land utilisation to initiate a 'learning region'.

Enhancing mobility across Europe, attracting good students, improving the EU innovation capabilities, are some of the key challenges for the development of the European Higher Education Area. Within the **Socrates Erasmus Program**, this Intensive program is only a short study program which brings together students and staff members from universities in different participating

countries in order to encourage efficient and multinational teaching of special topics, enable students and teachers to work together in multinational groups to gain new perspectives on the topic being studied, and allow members of the teaching staff to exchange views on teaching content and new curricula approaches and to test teaching methods in an international classroom environment.

Therefore the **main target** will be, to develop methodological approaches on how to initiate a dialogue between those who own soil and those who are interested in keeping soil multifunctional. Finally the aim of this phase of the IP project from 2006 to 2007 will be to develop a common vision for achieving a concept for a 'learning region' in order to obtain goals of a resource saving regional development in the Danube area. The question will be, how to bridge between the available scientific knowledge on one side and those who need it for defining policies, and operational procedures, such as stakeholders, politicians and decision makers on the other side, to keep soil and land use multifunctional. [Kvarda, 2006; p.21.-22]

The **didactical concept** of the IP pursues a transdisciplinary approach. The architecture of knowledge integration distinguishes between three levels – understanding the problems (first phase), conceptualizing through synthesis by methods of knowledge integration (second phase) and third causal explaining based on arguments arranged according to propositional logic.



Fig.4 Starting to find 'common ground' Karl Spachinger, Flora Möczenyi, Tamas Dömötör

Within the **first phase** of the IP SOIL I project from 2004 to 2005 we were analyzing the theoretical and practical examples from the 'five soil research clusters' (Blum et al. 2004), and were integrating the topics systemically within a search workshop, finally developing working on various case studies and projects about soil and land use to understand the problems. The Intensive programmatic seminar took place in **Neusiedl am See** from April 3rd to 17th, 2005. The soil indicator framework - the **DPSIR APPROACH** – and its application in practice helps to understand complex systems and processes and produces responses and solutions for strategies and operational procedures. The framework of the 'five main soil research clusters' served as a theoretical background for our project. [Blum et al., 2004b]

We were creating a common platform with the help of a **future search workshop**, to provide

‘common ground’ between the stakeholders from the region and the academics, preparing issues of sustainable land-use for politicians and decision makers. The theory of team-learning is starting with a dialogue in order to abolish inherent assumptions of the team members and to admit an authentic mutual thinking. In such a way participants see the world in a different perspective. Mutual team learning therefore can contribute to new perspectives and reflexion of visions.



Fig.2 Prof.Blum, Mag. Rosa Strasser, Prof.Onodi talking about the social culture of the project

For creating a **social basis and culture** of the IPSOIL project, Rosa Strasser was proposing to generate social capital from learning by experience through a special learning culture. Therefore the core questions were, fostering trust among the participants to allow open dialogue, to support the emergence of a new international scientific community, for a generation of new experimental knowledge about the complex issue of soil protection. [Strasser, p.5-6] The students were finally reviewing the workshop, writing an essay on how to promote the ability to contemplate the social phenomena occurring during the process. A few examples from the students **essays**:

The didactic concept: ... to find solutions which can be realized and transferred, the co-operation with social, economic and political sciences (W.D.)

Regarding the intercultural and interdisciplinary co-operation: ... totally new kind of learning. No stress, no barriers, no specialisation, just creativity and let it flow, a good atmosphere for working (A.M.)

Results: ... teachers became students for the time interval in Neusiedl (D.K.)

Within the **second phase** of IPSOIL II in March 2006, we were elaborating targeted projects of applied research for the multifunctional management of soil and land-use. The projects were dealing with primary and secondary responses towards satisfying the demand for improving new socio-political instruments or economic regulations, technical precautionary measures, legal instruments, ecological and also aesthetic structures.

If we want to solve the problems of soil degradation and develop an understanding in the society for creating a sustainable use of the soil and a **multi-functional land management**, we

have to choose this interdisciplinary and transdisciplinary method. Multi-functionality land use means to substitute the zoning principle of the physical separation of urban and rural activities with a true mix of patterns, which functions in order to benefit life in all its forms. Multi-functionality of soil means that soil can be used in all its main functions, such as biomass production, filtering, buffering and transformation, as a gene reserve and as a geogenic and cultural heritage and also as a physical basis.



Fig.3. Ecological design group

Within the **third phase** of IP SOIL III, we will initiate specific actions for policy support, to integrate the ‘Thematic strategy for soil protection’ from the DG Environment of the European Commission, within an empowering dialogue, to implement it on a regional basis. If we aspire new research methods and educational concepts, we have to change our traditional opinion within our scientific comprehension. We have to engage ourselves within group processes, which are evolving dynamically and dead openly to the intended procedure. Such a network of academic and professional representatives from different branches enables a transdisciplinary process, which must tackle several quite different issues which together are crucial for success:

- Produce knowledge that is scientifically reliable
- Address important issues in society to produce knowledge that is relevant for the future development of society and nature
- Involve actors and stakeholders in society in stimulating the mutual learning process between science and society that is necessary to producing knowledge that is effectively used [Klein et al.]

First we have to promote the awareness for the dynamic soil architecture, to make sure, that soil protection measures will be accepted among people. Soil education includes both the creation of the framework conditions for measures raising awareness [Mählmann, p.10-12] and an enhancement of a dialogue between all the partners (schools, adult education, universities, stakeholders of the region etc.) in an ongoing process to create effective governance towards a ‘learning region’ and by learning from each other more and more. The preparatory meeting for the learning region concept will take place end of November ‘06 in Neusiedl am See and as an initial event, we are organising a final conference March 16th 2007.

C. THE LEARNING REGION CONCEPT

The BOKU and the Academia Danubiana should become a brand name, a sign of quality for a regional biosphere based development process and knowledge based economy, including accelerated structural changes of human capital. It should also be a common trademark, giving corporate identity to the partners, within the academic and partnership network along the Danube. Results of this cooperation-network should create a 'line of pearls' of cultural centres along the Danube to improve the quality, European dimension and visibility of activities or issues of common interest in the field of a responsible use of soil and regional development. Therefore we want to achieve a cooperative network of universities, cities and towns along the Danube, emphasising a common vision of measures against uncontrolled sealing and damage of soil and land, intending to develop concepts for integrated land utilisation and to initiate a 'learning region'.

Against the background of a knowledge based economy and accelerated structural changes human capital is becoming more and more important. A **Learning Region** combines the pragmatic execution of learning and regional development. (Centrope, Uniregio) The regional education and science institutions are aligned with the regional development objectives and accordingly qualified inhabitants have to train the trainers and activate and integrate the stakeholders of the region for pushing the development. [Spachinger et al.]



Fig. 5 The Centrope region

As an example the **Centrope** vision aims at combining these two objectives and to establish a Learning Biosphere – Growth Region, in which renewable resources and technological know how (new professions) contribute an essential part to the competitiveness of the region and in which urban and rural areas are functionally linked according to this vision. The sustainable use and protection of biogenous resources and a Green Centre settlement principle characterize this region in which compact settlement locate along public transport axes and in which the valuable natural space as well as a recreational and agricultural space is conserved. [Puchinger]

The **communication between disciplines** of different scientific traditions depends mainly on communication among persons with different disciplinary backgrounds. Therefore, the quality of interdisciplinary knowledge cannot be independent

from the quality of interpersonal relations within the planning teams. Common values and emotional or political commitment may be determinant conditions for the quality of interdisciplinary results. The pleasure of interacting inside the group may be the determinant of the imagination and of the creativity that the group may be able to develop. The possibility of non-defensive behaviour and attitudes becomes essential. It may be easier to accept the areas of ignorance, which may stimulate further progress. [Henriques, p.394]



Fig. 6 Nationalpark Fertő / Neusiedlersee

The 'learning region' should be seen as a continuous learning process, that provides the region with a cross-sectoral platform to discuss sustainable land use development as a precondition for ecological awareness for collective action. It requires good levels of trust between regional and local administration and the different elements of stakeholders in the region based on the experience of working successfully together. It should enable the environmental and nature protection institutions together to release the potential of public, regional and political agencies and enable each of these to contribute to the achievement of awareness of a desirable and responsible land use of the region.

The **Neusiedlersee region** needs to become a 'learning region' and enhance institutional capacity building. This includes the capacity to work together between universities and between different groups like adult education and all kinds of regional partners or stakeholders. In Neusiedl am See the third area of the negotiation process "The public initiative" informs about ideas and thoughts, in which we can see impulses to achieve objectives of the city. Such an example could be the lobbying of the commune at the federal level for the establishment of a "University of the Pannonia region" in Neusiedl am See. Finally striving towards a 'learning region' in the future, the various educational institutions should mobilise their academic resources to undertake a regional SWOT analysis and identify what they can contribute individually and together through their teaching and research activities in building on regional strengths and exploiting opportunities and address weaknesses and threats. As a first common marketing strategy (cit. Borislav Stojkov), the two cities (Belgrade and Vienna) could be analyzed in terms of their role in the European integration process through major integrative key – elements: transportation, infra-structure, relation to the Danube as an ecological system, European cultural paths, cooperation of two cities etc.

D. THE FOLLOW UP OF IPSOIL - EDUCATION AND RESEARCH

The UN proclaims with the **Decade for Education** for sustainable Development from 2005 to 2014 that education will help to develop widespread understanding of the interdependence and fragility of planetary life support systems. Within the Comenius 3 network of Sokrates, the SEED project "School Development through Environmental Education" facilitates European school systems preparing the UN Decade in Education for Sustainable Development. The general aims of the basic program ÖKOLOG from the Austrian Federal Ministry for Education Science and Culture (BMBWK) in Vienna are, to improve the quality of environmental education, to involve the students actively for ecological awareness.

The University of Natural Resources and Applied Life Sciences – BOKU – in Vienna emphasises within the **Strategy for the Internationalisation** of the BOKU teaching and learning as the merits of internationalisation (see also the White Paper of the European Commission) The development of International Cooperation Networks should be considerably strengthened.

In the year 2002, 15 European Environmental ministers have outlined first steps towards a strategy to protect soils, on a level corresponding to water and air. The European Parliament resolution on the Commission communication 'Towards a Thematic Strategy for soil Protection' (COM(2002) 179) is targeting develop land use, preventing sealing of soil like other protected targets. As a first step we could try to integrate the strategic goals of soil protection and to implement it on an urban and rural basis. Threats to soil are often caused by social and economic damage, with the result that distressed urban areas are produced. They correspond to spatial concentrations of urban problems including diverse manifestations of poverty among inhabitants, economic decline and physical decay.



Fig.5 Empowering dialogue, Borislavov, Pottyondi

Territorial development planning as an **empowering dialogue** accepts the complexity that arises from the interaction among different agents at different territorial levels and recognizes the 'interests', 'reasons' and 'motives' underlying their 'rationalities' and strategic conduct. This requires knowledge about the field of forces in the context of which the 'discursive field' and the 'organisational' field gain their relevance for the deployment of Municipal 'causal powers' and the effectiveness of action. Understanding power and conflict becomes an essential feature in

planning as an 'empowering dialogue'. Territorial development planning as an 'empowering dialogue' aiming at anti-poverty 'locality effects' as a global, multi-level and complex approach. Therefore, it is based on interdisciplinary cooperation in the organization of scientific knowledge.



Fig. 6 The IPSOIL I group, 2005 in front of the Firestation in Neusiedl am See

For continuing the IPSOIL project, a **common platform** between education and research should pursue the following objectives:

- + to provide an overview in the field of soil and land use (through comparative studies and analyses);
- + to consider the various definitions used in different countries in terms of content and methodology, thereby contributing to the construction of a shared terminology at European level in the key areas of adult learning;
- + to identify present, emergent and future needs, and in particular to pinpoint aspects where European co-operation could be especially beneficial.

The Directorate-General for Education and Culture of the European Commission is promoting **Lifelong-Learning** with several programmes and Actions. The **Grundtvig 4** Networks are large-scale networks providing a forum for discussion and exchange of information on key issues, policy-shaping and/or research in their respective area of adult learning. One important goal of the initiative GRUNDTVIG is the empowerment of the process of the European integration through the transnational cooperation of adult education institutions in Europe. [Bgl. Forschungsgesellschaft] Each new Network should become a 'key player' in the promotion of European cooperation in its specific sector of adult education. Each Grundtvig Network should have partners from as many countries participating in Sokrates as possible. A Network must comprise organisations from at least 10 different countries participating in Sokrates. The Network will consist of a **co-ordinating institution**, selected by the partners to be responsible for the overall organisation, management and co-ordination of the activities and for the liaison with the Commission throughout the duration of the project period. Other core institutions chairing the Network's working groups could be, Austrian Federal Ministry for Education,

Science and Culture (BMBWK), IUCN (Dr. Lang) The World Conservation Union <http://www.iucn.org/>, Austrian Society of Soil Science, Österr. Bodenforum (Andreas Baumgarten), Serbian Spatial Planners, Belgrade Karpathenkonvention, Donauschutz Konvention, and others.

Kurt Puchinger is also suggesting one possible operational objective to develop a **pilot "curriculum"** with a 'post-graduate' orientation to qualify people to understand and manage a regional biosphere based development process. The target group should be professionals on different levels already involved in/or pre-qualified for regional development procedures. The general aims will strengthen the co-operation of education institutions (academia, non-academic) will improve job creation and help to make lifelong learning opportunities available to public institutions, NGOs (regional management) and in the private sector.

A network of excellence called **Academia Danubiana** has been established to promote a higher degree of territorial integration with the former and actual accession countries within the Danube region. <http://www.academia-danubiana.net/> The Academia Danubiana focuses on a scientific and educational network within various disciplines and paradigms in planning and systems design. It is addressed to all members of the socio-economic, ecological and administrative community in the broad sense – local authorities, students, teachers and non-government organisations. The aim of this program is about the establishment of visionary concepts and projects, offering postgraduate study programs and seminars to promote mutual learning within a dialogue between municipalities, universities, concerned industries, business, non governmental organisations and the society. The results should be communicated to the political-administrative system and the universities in the Danube region.

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