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COMMISSION ON LAND USE/COVER CHANGE**

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**PROGRESS OF IGU-LUCC
Looking back for IGU/LUCC commission activities 2004-2008**

Rules for commissions work have changed in last 12 years significantly. Despite of this we can say that after two periods of prof. Himiyama's leadership (1996-2004) our commission finishes successfully also the 3rd period of its activity, unfortunately affected by sorrowful passing away of commission chair prof. Alexander Mather. 12 years in commission life is a relatively long time. A lot of things has changed during these years – IT development, improvement in use and interpretation of remote sensing results, new methodological approaches based on searching for driving forces or DPSIR in land-use and land-cover analyses etc. As a success I think of wide participation of new interested persons in this interdisciplinary activities realized in IGU/LUCC framework and in bunch of international and national conferences, seminars and workshops.

IGU/LUCC focus has a wide scale of use, e.g. we can name dynamic (according to some authors historic) land-use, searching for driving forces influencing the change of landscape functions, mapping of landscape changes and its prediction at different scale levels etc. From local to regional, from state to continental and global changes. Commission by its activity gives an opportunity for discussions between researchers from different educational background about land-use changes and perspectives of next landscape development as a dynamic system. In my opinion just land-use research is an important contribution for understanding of nature-society interactions. It gives results which have character of basic research, it gives interesting bases for all sorts of applications including decision sphere at different scale levels and also it enables predictions of nature-society interactions. This approach is very specific because of its complexity and thereby is irreplaceable. Of course landscape and its changes is studied by a lot of branches of different sciences, but importance of IGU/LUCC commission work consists just in meeting of different research methods and in system approach.

I think commission activities in 2004-2008 illustrate significant quantity (and I hope quality as well) of our commission work. Thank all participants in last four years for their activity and at the same time I call for next work in wide range of land-use/land-cover topics. Besides publishing (atlases, contributions in special journals like Journal of Land Use Science etc.) we would like to arrange meetings and conferences at least once a year. One of the closest meetings will be IGU Congress in Tunis 2008 (and pre-congress meeting) where we can discuss meetings possibilities in next years and you can decide where new conferences will realize. We are looking forward to you.

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LINKS OF IGU-LUCC WITH OTHER PROGRAMS IGU-LUCC and the International Year of Planet Earth

Japan is one of the countries actively involved in the United Nations' International Year of Planet Earth (IYPE). (www.yearofplanetearth.org) The central year of IYPE is 2008, but the Science Council of Japan established the IYPE Japan National Committee as early as in September 2006, and the kick-off symposium of IYPE-Japan was organised in Tokyo in January 2007. A number of eminent figures including Eduardo de Mulder, the executive director of IYPE, Akito Arima, a former Education Minister of Japan, and Hiroyuki Yoshikawa, the Past President of ICSU attended this event. The Geographical community of Japan is represented by Takashi Abe, an urban geographer, and myself in the Committee. There is a friendly working relationship among the Committee members, as they all have a common goal, namely "Earth Sciences for Society". The Committee decided to devote much of the domestic resource to outreach, especially educational activities, rather than to science programs, and to work closely with the "International Conference on Global Environmental Education" organized by Hokkaido University of Education on 5-6 July 2008, i.e. immediately before the G8 Hokkaido-Toyako Summit (7-9 July). The G8 Summit, where global environmental issues are likely to be ranked high among the agenda, and IYPE are rare opportunity for geographers to work together with other disciplines, to strengthen and broaden their outreach activities, and to appeal to the society.

The XXXI IGC will be held in Tunis in August 2008, i.e. in the middle of IYPE, and promises to be one of the main events of IYPE, with special sessions already announced (www.igc.tunis-2008.com). IGU has been deeply involved in IYPE since its birth, and is willing to make substantial contribution to it. Anne Buttimer, the past

president of IGU and a member of IYPE Management Board, assumes responsibility as overall coordinator of IYPE-related activities in Tunis, with Adnane Hayder as her local counterpart. The IGU-IYPE strategy had involved her and the leaders of the ten themes of IYPE, namely “Groundwater”, “Hazards”, “Earth & Health”, “Climate”, “Resource”, “Megacities”, “Deep Earth”, “Ocean”, “Soil”, and “Earth & Life”. Each theme leader will organize one or two thematic sessions of his/her theme during the main congress with or without support of his/her commission. There will also be some general session(s) on "Securing together our territories", which is related to the main congress focus on "Building together our territories". Several of the ten themes of IYPE will be represented in the special session(s), and cross-cutting discussion will be coordinated. I have been invited by Anne Buttimer and have agreed to assume a leading role in the design and organisation of these general sessions. "Securing territories" can mean wide range of things, including securing land/ocean resources.

IGU-LUCC is related with some of the ten themes of IYPE, but the theme “resources” might be of the greatest interest. I am willing to organize thematic session(s) on “Resources” with the support of IGU-LUCC. Relevant papers/posters are welcomed, and should be submitted to me and to the local host coordinator (a.hayder@igc.tunis-2008.com). Land is not only a basic resource itself, but also a resource related closely with the use of other resources, such as water or biological resources. It is an essential element of the environment, which offers us most of the things we receive from the earth for our life. However, deterioration of this precious resource, as well as many other resources, has been accelerating at enormous speed in recent years for various reasons, such as unprecedented economic growth of China and other new economic powers, unbelievably backward energy and resource saving measures taken by some old economic powers, the failure of pollution abatement and other environmental measures, widening imbalance and injustice prevailing the world, and global warming. Studies of ecological footprint suggest that the depletion of the land resources and those of the productive ocean are serious threats to human existence. It is thought to be one of the highest priority issues for the world geographers, and one of the highest priority research themes of the IGU-LUCC community. Geographers, particularly the members of IGU-LUCC, might find IYPE a timely and good opportunity to appeal to the world regarding the land-related problems and the efforts of the people to solve them. Let us make the year 2008 the year of “Land-use sciences for society”.

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PUBLICATIONS in 2007

Gabrovec, M. (ed., 2007): Man in the landscape across frontiers – landscape and land use change in Central European border regions. Abstract proceedings of the IGU/LUCC Central Europe Conference 2007, 28 August – 4 September 2007, Slovenia – Austria – Slovakia – Czechia. ISBN 978-961-254-017-3.

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RECENT MEETINGS

Mobile conference „Man in the landscape across frontiers: Landscape and land use change in Central European border regions“. The event took place successively in four Central European countries – Slovenia, Austria, Slovakia and the Czech Republic – between August 28 and September 4 2007. More than 50 researchers from 14 countries (European Union, Japan, Australia, Russia) participated in the conference. Six main topics were in the focus of the conference: (1) Long-term land use and landscape changes (description, analyses, “driving forces” as causes, impacts etc.), (2) Man in the landscape in the past, present and future (society and its “metabolism”, anthropogenic impacts on landscape), (3) Peripheries and border regions (threats and opportunities), (4) Impacts of policies and institutions on land use and landscape, (5) Changing landscape in the enlarged European Union (border regions vs. interior), and finally (6) New and alternative functions in the rural space (biomass production, agrotourism, organic farming, nature protection etc.) (see below in part Reports for more information)

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FORTHCOMING MEETINGS

Conference Methodology and Methods of landscape research is organized in Krynica (Poland) in 3rd-5th March 2008 by Polish Geographic Society, University of Warsaw, Polish association for Landscape Ecology and other institutes.

International seminar on Land Use Land Cover Change and Agro-Biodiversity -
Lucknow, Uttar Pradesh, India – 7.-8. March 2008

Global Land Use Mapping Workshop. Institute of Social Ecology (University of Klagenfurt) and the Netherlands Environmental Assessment Agency, Vienna, Austria, May 22-23 2008.

31st International Geographical Congress - Tunis – 8.-11. August 2008 – pre-congress meeting

31st International Geographical Congress - Tunis – 12.-15. August 2008

Conference **Landscapes, identities and development** – Lisbon/Óbidos, Portugal – 1.-5. September 2008

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IGU LUCC OFFICE

After passing away of prof. Alexander Mather in autumn 2006 prof. Ivan Bičík was named as a chair of commission. Consequently IGU LUCC office was moved from Scotland to Czechia.

One of the main aim of this office was continuation of the IGU LUCC website. Before his passing prof. Mather started new pages at his university. „Old“ IGU LUCC website is still functional (<http://home.csis.u-tokyo.ac.jp/igulucc/>), but prof. Mather decided to make new one. This website is functional and now it is main website of IGU LUCC – <http://www.igu-lucc.org>. This website is „physically“ at server of University of Aberdeen, where prof. Mather worked. Anyway, after naming of a new chairman of IGU LUCC commission during IGU Congress in Tunis 2008 the website will have to move to some other place, depends on new chairman.

In addition to the new website, prof. Bičík after his naming created a totally new e-mail address for a chairman – igu.landuse@gmail.com – which is now official e-mail for a chairman and a new chairman will inherit this e-mail after him.

If you have any ideas how to improve the website, please, do not hesitate and tell us your innovative ideas. E-mail for your suggestion is igu.landuse@gmail.com. All your suggestions are welcome.

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REPORTS

Man in the landscape across frontiers: Landscape and land use change in Central European border regions

IGU-LUCC Central Europe Conference 2007

An unusual “travelling” international conference took place in late summer 2007 under the name „Man in the landscape across frontiers: Landscape and land use change in Central European border regions“. It was held under the auspices of Land Use / Land Cover Change Commission of International Geographical Union (IGU-LUCC) and Global Land Project (GLP). The event took place successively in four Central European countries – Slovenia, Austria, Slovakia and the Czech Republic – between August 28 and September 4 2007.

The conference was organised by a cluster of universities and scientific institutions of the above-mentioned countries - namely Charles University in Prague (Czech Republic), University of Klagenfurt (Austria), Slovenian Academy of Sciences and Arts (Slovenia), Comenius University in Bratislava, and Slovak Academy of Sciences (both Slovakia). The main coordinators of the conference were Ivan Bičík (Czech Republic), Matej Gabrovec (Slovenia), Fridolin Krausmann (Austria), Pavol Hurbánek and Monika Kopecká (both Slovakia); but many others cooperated in the organisation as well. Several grant projects of these countries supported this event – namely the contract GAČR 205/05/0475 (Grant Agency of the Czech Republic), the contract APVT-20-016704 (Research and Development Assistance Agency of the Slovak Republic), Bilateral Program of Scientific and Technological Cooperation KONTAKT (Slovenia – Czech Republic, project No.5, 2006/7) and the program P6-0101 (Slovenian Research Agency).

More than 50 researchers from 14 countries (European Union, Japan, Australia, Russia) participated in the conference. Two buses were used to transport the participants from one place to another. The event concentrated on land use and landscape changes in peripheral and border regions, particularly in Central Europe (or, in the former Austrian-Hungarian Empire, to be precise). Six main topics were in the focus of the conference: (1) Long-term land use and landscape changes (description, analyses, “driving forces” as causes, impacts etc.), (2) Man in the landscape in the past, present and future (society and its “metabolism”, anthropogenic impacts on landscape), (3) Peripheries and border regions (threats and opportunities), (4) Impacts of policies and institutions on land use and landscape, (5) Changing landscape in the enlarged European Union (border regions vs. interior), and finally (6) New and alternative functions in the rural space (biomass production, agro-tourism, organic farming, nature protection etc.).

Many interesting field-trips to different landscapes were held during the conference, during which, after a walk and sightseeing, “local” (national) organisers had a short presentation, followed by a discussion about threats and opportunities in a given landscape, and about its possible solutions. The most successful field trips were to Ljubljana moor and Velika Planina (Slovenia), Traisental region (Austria), Devin, Cunovo and Zahorie (Slovakia) and Lednice-Valtice, Mikulov and Pálava (Czech Republic). Four “classical” half-day seminars were held in three cities (twice in Ljubljana, and then in Bratislava and Mikulov), where the participants had their own presentations, followed by a fruitful discussion. Several cultural and social events were on the itinerary as well (icebreaker party on a river boat in Ljubljana, farewell dinner with traditional music and wine in an old cellar of the city of Mikulov etc.). The participants also enjoyed typical local and national meals and cuisine; actually, it turned out that many “traditional local dishes” seem to be a common heritage of the old Austrian-Hungarian Empire (e.g. the “strudel” etc.).

Put together, the participants have enjoyed a complex cluster of experiences from many fields – they had an opportunity to listen to scientific findings of their colleagues from different parts of the world, they could personally visit totally different types of landscape (urban, rural, flourishing, in decline, tourist, abandoned, lowlands, highlands etc.) and compare them with each other and with their own experiences, and they also had an opportunity to reveal both differences and common features of Central European peoples, cultures and institutions. For instance, we could compare different management practices of vineyards in Austria and Czech Republic, different approaches to mountain agro-tourism in Slovenia and Austria, or totally different

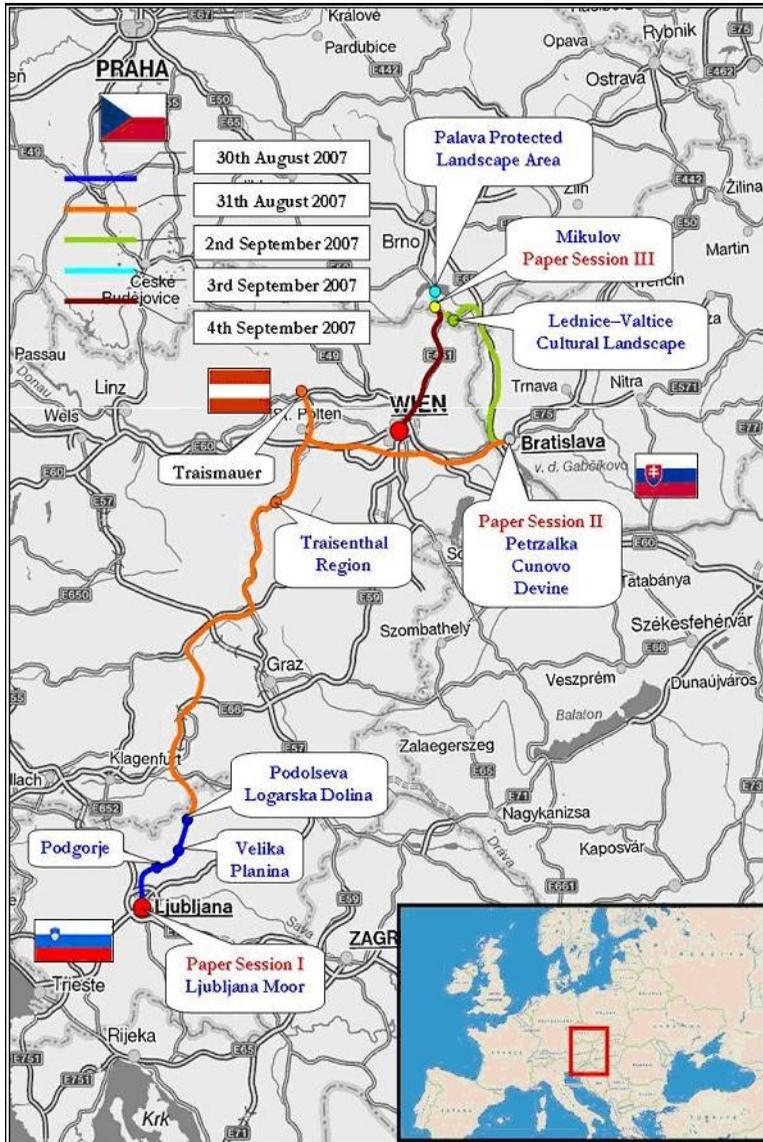
layouts of agricultural landscape on both sides of the former Iron Curtain (former Czechoslovakia and Austria). Generally, the Iron Curtain together with the (negative) heritages of the socialist systems was a very important issue during the whole conference.

Finally, we cannot omit a big importance of the conference for establishing new friendships and partnerships among the participants – especially the younger ones. We hope to have founded new ties of cooperation between scientists throughout Europe.

The first result of the conference was a printed Abstract Book (ISBN 978-961-254-017-3). Each participant also obtained a paper book of Excursion materials. Currently, an electronic version of Conference Proceedings (on a CD-ROM) is in the final stage of preparations, and is going to be issued in March 2008 (ISBN 978-80-86561-80-6). Any of these publications can be obtained by writing to conference2007@natur.cuni.cz or kabrda@seznam.cz. For the future, negotiations are held to publish the “best of” the conference articles in a paper form in some national (Czech, Slovak or Slovenian) geographical journal in English, or even in an international journal.

More information about the conference, together with many photos from the event can be found on the web pages of the Czech land use / cover research team: <http://www.luccprague.cz>. Below, we add a map of the conference route and two photos from the event.

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Conference route with main field-trips and paper sessions.



The surrounding landscape was so interesting that we have never managed to get all the participants in one photo. Anyhow, in this picture, almost all of us are standing in front of the mountain farm Zgornji Zavratnik, Velika Planina Mountains, Slovenia.



“Late night, last day, only the strongest stay”. Wine cellar of Hotel Eliška, Mikulov, Czech Republic. Lying is the head of the organising committee, prof. Ivan Bičík.

Regional Branch of the IALE in the Czech Republic (IALE-CZ)

Czech Association for Landscape Ecology - Regional Branch of the IALE for the Czech Republic (IALE-CZ) was established and officially approved in 1999. The aim of the activities of the IALE-CZ is to contribute to further development of landscape ecology as scientific discipline influencing in the most important way the praxis of landscape planning, landscape character assessment and landscape protection. Discussion on the methods of teaching landscape ecology at universities is also running under the umbrella of the IALE-CZ. The Czech Association for Landscape Ecology has organized more than 100 full members at the present. They are informed by a quarterly published newsletter - the Bulletin of the IALE-CZ), which exists both in printed and electronic form. Each issue of the extent of 8-24 pages brings brief information about inland and international activities in the field of landscape ecology, presents institutions active in the field, publishes official reports from meetings of the Main Committee and annual reports of the Society, informs on conferences, workshops, new books and other actions in the field of landscape ecology.

Since 1999 the Czech Society for Landscape Ecology (IALE-CZ) organises the annual General Assembly associated with a one-day working seminar or conference open to wider professional community. Since 2003 the conference *Rural Landscape* is co-organised by the IALE-CZ in the centre of ecological activities Hostetin in the Landscape Protected Area White Carpathians (Eastern Moravia) in May every year. The conference is proposed as interdisciplinary international conference of young scientists with a view to rural landscape. Since 2001 the conference *Ecological Networks* (every year in September in Brno) and since 2003 the conference *River Landscape* (every year in October in Olomouc) are co-organised by the IALE-CZ. Proceedings from all conferences are regularly published, usually both in printed and electronic form. The topic of land use and landscape changes belongs to the most topical and frequented issues in the Czech landscape science during last two decades. In 2005 and 2006 the first two volumes of the series „*Ecology of Landscapes*“ have been published by the IALE-CZ. In 2007 we decided to transform it into regular scientific journal published in English language at least twice a year. The signal volume of the „*Journal of Landscape Ecology*“ has been prepared at the occasion of the IALE World Congress 2007 in Wageningen.

The President of the IALE-CZ and other members of the Main Committee conducted negotiations with representatives of the Ministry of Environment of the Czech

Republic with aim to take advantage of the wide professional experience of the Society members to solve important targets of the state authorities related to landscape ecology. Invitation to work in the inter-departmental working group established for the procedure of negotiation and implementation of the European Landscape Convention was one of concrete results of these efforts. In 2007 our collaboration with the Ministry of Environment was aimed at the preparation of the first draft of the Landscape Policy of the Czech Republic.

We would like to initiate a discussion on the topic of teaching landscape ecology at universities and PhD education in landscape ecology in the short time. We also want to improve and deepen our collaboration with landscape engineers, land use planners and landscape architects and to lobby in a proper way for landscape ecology as a scientific discipline which should formulate basic theoretical principles for applied disciplines dealing with the protection, use and transformation of the cultural landscape.

Working Group „*Landscape Planning*“ has been established in the framework of the IALE-CZ in 2006.

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Identification, analysis and assessment of land cover and its changes at the Institute of Geography, Slovak Academy of Sciences in Bratislava, Slovak Republic

Cognition and assessment of land cover and its changes are based on use of remote sensing data (satellite and aerial). They are being developed at the Institute of Geography SAS by participation in varied international and national projects.

The Institute cooperated and still cooperates in the all-European CORINE Land Cover 1990 (CLC90), CLC2000 a CLC2006 Projects, aim of which is to derive land cover Slovakia data layers of the 1990s, 2000 (+/- one year) and 2006 (+/- one year), and data layers corresponding to its changes in 1990-2000 and 2000-2006 in the context of analogue all-European Projects. CLC90 and CLC2000 data layers represent new digital sets about land cover of Slovakia at scale 1:100 000 derived of the Landsat satellite data available to users at <http://atlas.sazp.sk> . CLC2006 data layer of Slovakia should be finished in May 2008. Change assessment and analysis for the period 1990-

2000 revealed that 580.3 km² of forest changed into transitional woodland/shrubs, while 529.7 km² of transitional woodland/shrubs naturally developed into forest. It also showed enlargement of complex cultivation patterns by 165.6 km² and the area of urban fabric industrial and that of leisure facilities along with communications increased by 45 km².

The aim of the FP5 European Union “*BIOPRESS*” project was to test the methodology that could be applied to monitoring habitats and their biodiversity by using aerial photographs from 1950s to 2000 distributed across Europe: 73 windows (30 km x 30 km; 25 ha resolution) and 59 transects (2 km x 15 km; 0.5 ha resolution). It was at the Institute of Geography where the “*Manual of computer aided visual interpretation of aerial B&W photographs*” and “*Photo-to-Photo Interpretation Manual*”, necessary for interpretation of aerial images in this Project were prepared.

The Institute of Geography SAS in cooperation with two institutes of the Bulgarian Academy of Sciences (Solar-Terrestrial Influence Laboratory and Institute of Geography) participates in the bilateral project: “*Spatial analysis and assessment of landscape structure and changes in selected regions of Slovakia and Bulgaria based on remote sensing data for the period 1990-2006*”. Selected specific features of the sixteen-year development of the landscape will be evaluated in the context of social and economic conditions and used as a source material for prediction of trends in development of the landscape for the decision making and planning bodies.

The updating of the CLC2006 data layer is expected to be finished in May 2008 and the project objectives are:

- to identify, analyse and assess landscape structure and landscape changes in selected territories in Bulgaria and Slovakia for 3 time horizons (1990-2000-2006) using the same methodological procedure in order to receive comparable results;
- to compare essential differences in the landscape dynamics and
- to explain regional specific features in development of the landscape as determined by different natural and positional conditions and traditions of the social and economic development of both countries.

Using several landscape indicators derived of land cover maps, the landscape mosaic and its changes in similar landscape types will be described. Special attention will be paid to changes of the forest area and forest fragmentation.

The aim of the Project “*Assessment of the contemporary landscape by application of the CORINE land cover database according to environmental principles*” financially supported by the VEGA Grant Agency, was the analysis of geoecological landscape structure by means of natural landscape types and applying the method of integrated landscape research and GIS at local and regional scales, which resulted in compilation of the map “*Natural landscape and land cover of Slovakia at scale 1:500 000*”. The map provides the picture of the natural landscape, and the landscape changed under the human impact. The data layers of the natural landscape and the contemporary landscape became source material for the assessment of the landscape structure from the point of view of its spatial arrangement and suitability for its use by society. Applying the GIS, the development and long-term changes at the national and regional levels were assessed. Short-term changes identified by means of CLC classes for the last 30 years (1970-1990-2000), were assessed in the context of social, economic and political stimuli on example of selected regions. Solutions of these problems were parts of the “*Landscape mapping and evaluation by application of the remote sensing techniques and the geographic information system*” Project financially supported by the VEGA.

The Institute of Geography SAS in Bratislava will continue in its research activities with the envisaged participation in the all-European programme *Global Monitoring for Environment and Security (GMES)*. Our activities are also opened for partnership with researchers from other countries who are interested in landscape change assessment based on the CLC data.

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Correcting the mistakes from the past – remediation of riparian areas on the Danube floodplain between Neuburg and Ingolstadt (Bavaria/Germany)

During the first half of the 19th century works started to embank the main parts of the Upper Danube completely. Since that time the river flows in dikes, normally without any contact to its floodplain and the riparian areas. In the majority this brought advantages to the population. It was possible to use the former wetlands for settlements, agriculture and forestry. After several decades typical floodplain and

wetlands features became invisible – no oxbows, no softwood riparian forest, and no shallow waters with the appropriate fauna and flora. The interconnection between river and floodplain had diminished – the river flew like an alien through a cultural landscape. The second half of the 20th century brought the construction of hydroelectric power stations in form of large barrages. From this time also the migration of fish was stopped. Nowadays the Upper Danube (average discharge is about 300 m³/s) is more or less a human managed canal.

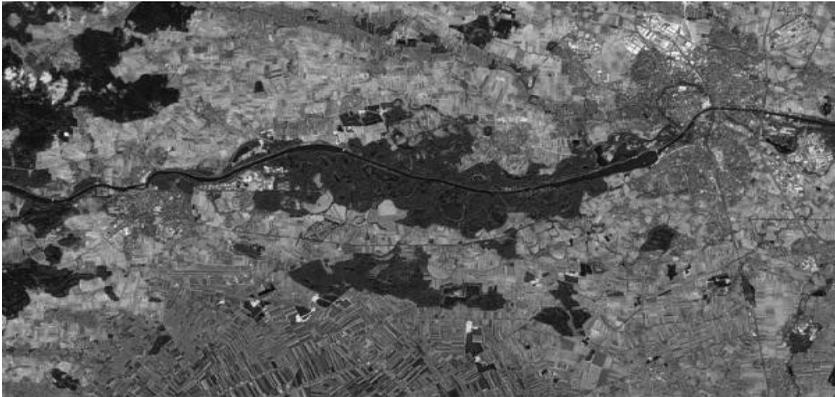


Fig. 1: The floodplain between Neuburg and Ingolstadt of today (the large dark area in the middle). Satellite image from MRSid data base.

The main goal of the restoration in this case is to bring more dynamics to the existing floodplain. Dynamics to the groundwater level, to the water surface and water courses, and to the morphological features as sand and gravel banks and the watersides itself. Therefore the hydrological processes are targeted as the most importance ones. Nearly everything in a natural floodplain has a relation to hydrological processes and is connected hydraulically. If one is able to use water as an adjusting screw many other related features (e.g. vegetation) will adjust itself after a certain period.

Nowadays the floodplains experience a revival in the thinking of man. Unfortunately many parts of vulnerable riparian areas have diminished, and with the Bavarian Floodplain Programme the search for suitable (floodable) areas began in 2002. The largest joint part was found with the riparian forests between Neuburg and Ingolstadt. In November 2005 the Bavarian Minister for the Environment dug the first turf to start an 14 million USD pilot project named “Restoration of riparian areas on the Danube

floodplain between Neuburg and Ingolstadt”. In future about 2,100 hectares of forests are used for both artificial man-controlled flooding to improve biodiversity in the riparian forest and the flood meadows and to serve as a flood storage in case of disastrous floods.

The contribution will show the natural basis of the pilot project, the technical pre-conditions and buildings to steer the flooding, and the hopes of authorities and environmental associations connected with the project. The scientific attendance is carried out by the newly founded Floodplain Institute Neuburg which future task it is to spread the results on a national and international level.

There are very special conditions to overcome in this dammed up environment. The pilot project is in the phase of erecting the wires for the bypass which will bring a permanent flow of water (up to 5 m³/s) to the floodplain. As a result of this a new river will develop on the floodplain partly flowing in old oxbows, but partly eroding its way naturally. Together with the controlled floodings (up to 30 m³/s during peak discharge of the Danube) groundwater dynamics will improve and the growing of typical riparian species will be possible. A long-term monitoring plan for selected species in special transects is under construction and ready for discussion.

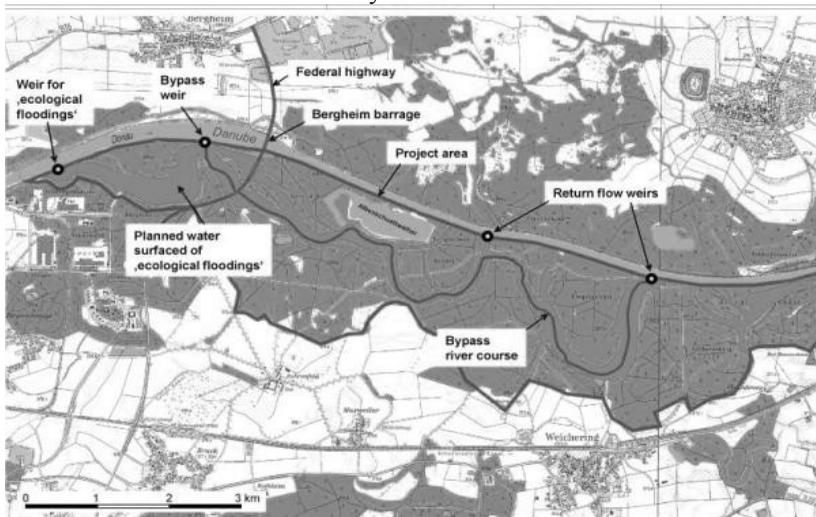


Fig. 2: Project area and location of the planned weirs, the bypass and the area of “ecological floodings”.

Apart from the mentioned benefits the pilot project is scientifically absolutely exciting because it is a unique and large zoological, botanical and morphological field experiment which can serve as a model for other restoration measures on river floodplains in dammed-up environments.

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The Conflict between Farmland Protection and Land Use Practice in China since 1978

1. Introduction

China is a country seriously with cultivated land resources shortage as far as its huge population scale and per capita cultivated land are concerned. It is very important for China to effectively protect its cultivated land resources. Chinese government has issued many laws, regulations and the relevant policies for arable land protection for its food security and the national economy development since 1978, but what happened to the land use practice looks like another thing. It is very interesting to briefly look at the effectiveness of the implementation of these protection institutions in reality since the policy reform. Through a very brief summary of the relation between the progress of these protection institutions and the continuous reduction of arable land in the past 30 years, we may see clearly the conflict between the national land protection laws, regulations and the relevant policies and the land use practices.

2. Development stages of arable land protection management institutions and policies and arable land reduction in reality since the policy reform

The development of arable land protection management institutions and policies and arable land reduction in reality in China could be roughly divided into three stages since the policy reform in 1978.

The first stage is from 1978-1985, when arable land loss became serious in China due to the starting of re-modernization. During this period, with the policy reform, China

started taking modernized way for its administration management in every fields, the resources management as well became more and more reliant on laws and regulations. For the rational use of farmland, arable land protection policies were under preparation and two important state regulations concerning land use management in China as ‘State Regulations for the Construction Land Use’ and ‘Management Regulations for Rural House Constructions’ and some other relevant regulations and policies were issued. But, in fact, the arable land resources loss in total reached 3.16 million hm², about 0.45 million hm² per year, about 23 per cent of the loss was contributed to the house construction and rural enterprise development in rural areas. These institutional documents clearly requested the governments at every levels strictly checked the misuse or damage actions of cultivated land, showing Chinese government’s keen concern about arable land protection.

The second stage is from 1986-1997, during this period, some important things appeared which were favorable for the arable land resources protection, that is the establishment of the first special organization for land resources management in China, that is, the State Land Management Bureau, and the following issues of laws and regulations for arable land protection as the first land resources management law of China, ‘Land Management Laws of People’s Republic Of China’ and ‘Announcement for the Strict Land Management and Check the Misuse or Damage Actions of Cultivated Land’, in which the farmland protection was declared as the state basic policy. The result shows that the arable land loss to other land use purposes had been effectively controlled, the total arable land reduction was decreased to 0.88 million hm² in total, only about 0.08 million hm² loss per year, which is merely about 17.8 per cent of the loss in the previous period. This fact seems showing us the effectiveness of the authority of the state land management organization and the concerned laws and regulations for arable land protection in this period. This is the best arable land protection period in the recent 30 years as far as the arable land reduction is concerned.

The third stage is from 1998 to the present time. During this stage, things seem become more difficult to understand. On one hand, for arable land resources protection, Chinese government revised the Land Management Laws (1998), which stipulated clearly that any reduction happened to the total arable land resources was not allowed, and at the same time the government has continuously issued a series of laws, regulations and policies for farmland protection as ‘Regulations for the Protection of Basic Arable Land’(1999), ‘Regulations for the Implementation of Land Management Laws’(1999). Especially, in ‘the Outline of State Planning for the Eleven-Five Period’(2005), put forward the Red Line concept for farmland

protection. That is, China has to keep about 1.8 billion Chinese mu (about 120 million hm²) of arable land before 2020. On the other hand, however, the situation of arable land resources reduction has become worse than before. During the 7 years from 1998 to 2005, arable land loss in total reached 7.39 million hm², about 1.06 million hm² loss per year, about 2.4 times that the loss in the first stage and 13.3 times that in the second stage. The more serious is China has the total farmland about 1.83 billion Chinese mu at the end of 2006, which is very near to the protection goal of the Red Line in 2020, so as Premier Wen Jiabao anxiously pointed out we have to hold the Red Line for our farmland of 1.80 billion Chinese mu, when he delivered his 'Government Work Report 'on March 5, 2007. It is a ridiculous situation that the more land protection laws, regulations and policies appear, the more reduction of farmland happens.

3. A brief summary of the failure of arable land protection institutions and policies of China since 1978

1) It is very clear to see that the effectiveness of arable land resources protection laws, regulations and the concerned policies has been declined in the recent 30 years. That is China has more and more institutions for the arable land protection, but, the arable land reduction has not been held back. The causes behind are complicated, but the causes resulted in this effectiveness fall and every land use problems or land use conflicts are mainly rooted in the weak implementation of these policies, laws and regulations for arable land protection.

2) Actually, high or low effective protection of arable land reflects the administrative management ability of the governments in a country's resources, the long-term conflict between arable land protection and rapid arable land reduction in practice shows the weak management ability of the governments who are making and deciding these policies, laws and regulations on one hand, on the other hand, the conflict also shows that, in many cases, the governments themselves are the larger land users. This fact decreases their land resources management ability.

3) How to solve the conflict between arable land protection and land use practice and hold back the trend of the arable land resources reduction is still a question facing China at present and in the future. Being the main body for the land management, Chinese government has to enhance its scientific and strict management ability, and at the same time, to limit their roles as land users, so as to realize effective and scientific management for its land resources and arable land resources protection.

4) It is very difficult to avoid the trend of farmland reduction in China since China is in the acceleration period of modernization (including industrialization and urbanization) process and the long-term rapid economic boom since 1978, which has happened everywhere all over China. The development impulses coming from the central government, local governments and individuals have made Chinese people engulf farmland, meanwhile, though they know very well and very clearly about these institutions for the farmland protection. The misuse of farmland merely could be controlled by more rational and strict management skills based on more scientific designs.

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