

COVER PAGE – PART B

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UD_AGR_REPO

Proposal full title:

**IMPROVING RESEARCH POTENTIAL OF THE INSTITUTION FOR LAND UTILIZATION,
TECHNOLOGY AND REGIONAL DEVELOPMENT ON THE FIELD OF GIS, PRECISION
AGRICULTURE, LAND USE AND REGIONAL DEVELOPMENT**

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Name of the coordinating person:

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List of participants:

Participant no.	Participant organisation name	Country
1 (Coordinator)	Institute for Land Utilisation, Technology and Regional Development (ILTR)	Hungary

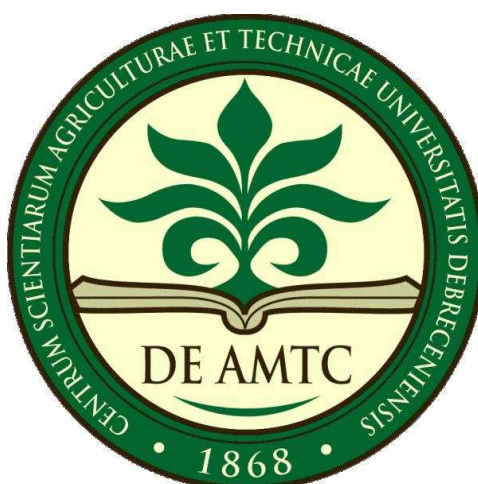


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Proposal

1: Scientific and/or technical quality, relevant to the topics addressed by the call

1.1 Concept and objectives

Precision cultivation, landscape design and landscape rehabilitation research is a significant scientific course at the **Institution for Land Utilization, Technology and Regional Development (ILTR)**. ILTR is the most significant basis knowledge in the region, therefore the conditions and efficiency of its operation requires continuous development¹.

Teaching of cultivation and farming has a long history in the North Great Plain (Észak-Alföld) Region. The agricultural college has been opened in October 1868; its name was National Higher Economic Educational College

The College continued its operation as Agricultural College from 1962 and after receiving the rating of university in September 1970, as Agricultural University of Debrecen. The Institute for Cultivation and Ecology was established in 1978. As a result of the changes carried out in the higher education in the last decade, after the integration of multiple departments the Institution for Land Utilization, Technology, and Regional Development (ILTR) has been established.

The University of Debrecen Centre of Agricultural Sciences and Engineering (UD CASE) is the centre and co-ordinator agricultural higher education, research and technical advice in Eastern Hungary, its mission is to preserve the environment and to develop rural areas in this region. The institution trains innovative specialists with good theoretical and practical knowledge who are able to apply and independently improve the obtained knowledge and who have high level organizational and managerial skills. These graduated specialists are employed on various fields, e.g.: agricultural education, research and production, technical advice, services, commerce and finance. By means of internationally acknowledged scientific work and the specialized training of young people the institution itself also contributes to the development of a sustainable economy and the scientific establishment of observing, preserving and effectively utilizing the environment.

Essential part of the Institute is the Regional Development Research Group which was set up jointly with the Hungarian Academy of Science (HAS). The research carries out significant research activities within the 'Tiszántúl' region.

ILTR operates on three main fields of research: precision agriculture (especially cultivation, soil preservation), quantitative agro-ecology and its modelling, and regional development with a successful co-operation of the Debrecen department of HAS Centre for Regional Studies.

35 full-time employees work at ILTR, **5 of them are university professors** (*they are also DSc of the Hungarian Academy of Science*), **14 of them have PhD degrees** (*11 of which are associate professors*). All 19 of them are involved in the research activities of ILTR. During the last five years total number of publications of ILTR is 176 (37 of which was written in foreign language).

¹ Nagy, J. The role of University of Debrecen and agricultural higher education in the development of North Great Plain Region and cross-border relations
In: Baranyi, Béla (ed.) Establishment of cross border relations and the regional aspects of agriculture in the eastern edge of the EU. Debrecen: HAS, Centre of Regional Studies, 2005. pp. 29-40.

Nagy, J. Baranyi, B. Role of the University of Debrecen in regional development. In: Buday-Sántha A, Erdősi F, Horváth Gy (szerk.) Évkönyv, 2004-2005. Pécs: University of Pécs, 2005. pp. 203-213.

Nagy, J. Scientific co-operations in regional development. DEBRECENI SZEMLE XIII:(1) 36-45 (2005)

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- Dobos A, Nagy J. 2003. **The effect of fertilization on the dry matter accumulation and moisture loss dynamics of grain yield in different genotype maize hybrids**. In: Liviu AL Marghitas (ed.) Buletin, Cluj-Napoca: University of Agriculture, XXI. 240–246
- Pakurár M, Nagy J. 2004. **Jagendorf S, Farkas I. Fertilization and irrigation effects on maize (*Zea mays* L.) grain production**. Cereal Res Commun, 32, 151–158
- Tóth VR, Mészáros I, Veres Sz, Nagy J. 2002. **Effects of the available nitrogen on the photosynthetic activity and xanthophyll cycle pool of maize in field**. Journal of Plant Physiology, 159, 627–634.
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- Nagy, J., Huzsvai, L. 1996. **The effects of precipitation on the yield of maize (*Zea mays* L.) yield**. Cereal Res Commun, 24, 93–100.
- E Harsányi - G Harsányi-AJ Nagy-Cs Kiss 2007. **The impact of various land use types on the living conditions of people employed in agriculture**, Cereal Res Commun, 35, 275–280
- Dobos, A. – Nyizsalovszki, R. – Széles, A. – Harsányi, E. 2006: **Optimalisation of land use in sensitive, lowland areas in the Tisza River Basin.**, „Bibliotheca fragmenta agronomica” IX ESA Congress, Warszawa, Poland, 637–638
- E Harsányi -G Harsányi-AJ Nagy 2006. **The Situation of Agriculture in the National Economy**. Cereal Res Commun, 34, 785–788
- E Harsányi -G Harsányi-AJ Nagy: **The Situation of Agriculture in Economy of National Food Production**, Cereal Res Commun, 34, 821–824
- Harsányi E – Nagy J – Rátónyi T – Harsányi G – Kiss Cs 2006. **Biofuel raw material development considering variety issues** - „Economic questions of the utilisation of alternative energy resources” – international scientific conference, University of West Hungary, Sopron
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- Harsányi E - Harsányi G - Nagy AJ 2005. **Spatial developmental differences in Hungary and the North Great Plain region**. Agricultural Publications, Debrecen 2005/18. 62–71
- Harsányi E 2004. **Objective areas instrumental and institutional system of regional development, its present and perspectives of development**, Agricultural Publications, DAB, 138–142.
- Dobos A.-Nagy J.- Szabó J.- Dorka D. Harsányi E.- Nagy P.- Taraczközi K.- Pásztor L 2002: **GPS/GIS Technological application possibilities of GPS/GIS in cultivation**, Professional Conference. Nyíregyháza 20-22nd September, 2002. Conference publication. 28-29.
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- Dobos A. Pázmányi S. 2006. **Application of an agricultural geo-information system in nutriment management**, In: Nagy J., Dobos A. (ed.) Environment friendly cultivation – quality production. UD Agricultural Centre, Debrecen, 48–62.
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- Sulyok D.-Megyes A.-Rátonyi T.-Nagy J. 2007. **Establishment of short rotation energy plantations as an alternative possibility in less favoured areas.**, Cereal Res Commun, 35, pp. 1109–1112
- Rátonyi T.-Farkas Cs.-Gyuricza Cs.-Jakab P.-Juhász Cs.- Szöllősi I. 2006. **Role of field conditions in cultivation**, In: Tillage science and land use (ed: Birkás Márta), Mezőgazda Publisher, Budapest, p. 413., pp. 22–62
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- Huzsvai L.-Rátonyi T.-Megyes A.-Sulyok D. 2006. **Evaluation of soil parameters with principal component analysis.**, Cereal Res, Commun, 34, pp. 211–214
- Huzsvai L.-Rátonyi T.-Megyes A.-Sulyok D. 2005. **The effect of reduced tillage methods on the physical characteristics of the soil and organic matter cycles.**, Cereal Res Commun, 33, pp. 399–402
- Nagy J.-Rátonyi T.-Pakurár M.-Szabó Gy.-Bognán I.-Megyes A.-Dobos A. 1997. **Interactions on soil cultivation systems and fertilization.**, In: Land Use and Soil Management. Szerk: Filep Gy. Debrecen., pp. 197–207

Educational activity (BSC, MSC, PhD)

As a unique feature in Hungary computerized modelling of plant-soil-atmosphere has been introduced in the educational processes. Significant guest lecturers of ILTR: J.T. Ritchie (University of Michigan), G. Hofman (Ghent University), P.J. Gregory and R.J. Summerfield (University of Reading).

The Doctoral School offers Land Utilization-Regional Development, Agro-technical-Environmental management, Horticulture, and Horticultural Biotechnology doctoral programmes. The Doctoral School researches the most efficient methods and development possibilities of sustainable agriculture by involving multiple fields of research: farming, soil studies, cultivation, plant

protection, land utilization, soil preservation, soil improvement, agro-meteorology, agro-technology and regional development.

Soil preservation as the essential element of sustainable agriculture is an important task as well as the analysis, evaluation and spatial extension of the nutriment flow of soils. Rational soil use, the preservation of productivity of soils (modern, environmentally sound agro-technology, nutriment management and irrigation) are also important fields of research.

Research results establish the improvement of the efficiency of agricultural land utilization and regional development, ensuring that the interventions are environment friendly and they comply with the requirements of sustainable agriculture.

The co-operation of the Doctoral School of and the other departments ensures the high quality work of PhD students, their integration into the international research community. The Doctoral school has 73 students so far.

International lectures

Lecturers, researchers of the ILTR have given lectures at numerous universities and research institutions: IARC Rothamsted, Great Britain (2000); University of Reading, Great Britain (2002); University of Wageningen, The Netherlands (1996); University of Padua, Italy, (1995); University of Hawaii, USA (1996); Ghent University, Belgium (2005); University of Munich, Germany (1997); University of Vancouver, Canada (1998); University of Brisbane, Australia (1999); University of Sao Paulo, Brasilia (2000); University of California, USA (2001); Writtle College, Essex, Great Britain, (2004); Agricultural Academy of Ukraine, (2004); University of Lyon, University of Nice, France, (2004); ESA Copenhagen, Denmark, (2004); FAO, Rome, Italy, (2004); University of Glasgow, Scotland, (2005); St. Petersburg, Russia, (2006).

Scientific co-operations:

There is an excellent relationship with numerous foreign research institutions. The German, Greek, Dutch, Polish, English, Belgian, Swedish and American connections are prosperous in both educational and research activities.

Previous, ongoing and planned projects for possible synergies between EU funding schemes

The staff of ILTR participates in numerous national and international projects.

- One of the most recent projects was the 'Corn Consortium' implemented within the scope of National Research and Development Programme. The project co-ordinated the national corn-genetics and agro technological research activities and the scientific dissemination of their results.
- Another successfully finished project is the 'Development of cultivation technologies with reduced number of turns for the improvement of competitiveness', which was an acknowledged R&D programme on national level. The British-Hungarian project 'Long-term field experimental and large-scale field dataset' achieved international success.
- The most recent high volume research activity is the 'Methodological support of sustainable and precision agriculture systems' (OTKA TS 049875). The methodological background and the research of the development of plant growth models and optimization of nutriment supply are ensured by international co-operation. The most important partners are: the IBSNAT group led by Professor J.T. Ritchie (USA) and the research groups led by Per Erik (Sweden), George Hoffman (Belgium), Peter Gregory (England).
- 'Joint environmental and cultivation technology research and its evaluation' and 'Significance of legumes in nutrition and soil protection' with the Department of Agriculture and Pedology of the University of Reading.
- 'Development of environmental models, linking yield models with GPS/GIS technology' with the University of Munich
- 'Research of organic matter utilization, joint evaluation of carbon traffic, environmental protection and field trials' with the Rothamsted Research Institution
- 'Regional enterprise supporting centre' - Phare-CBC project (2004)
- 'Cross-border rural development and advisory centre' - 'Phare-CBC (2005-2006)

- 'Integration of Romanian Horticulture with European and International Cryopreservation of Germplasm' – CEEX (2006)
- 'RuralJobs: New sources of employment to promote the wealth-generating capacity of rural communities' - FP7-KBBE-2007-1
- 'Agricultural Geo-Information System' - EU-GVOP-3.1.1.-2004-0184/3.0 - consortium leader
- Hungary-Romania Cross-Border Co-operation 2007-2013 project 'Development of competence-based adult education e-learning programme launch of a training for stimulating SMEs' – *has won and is to be launched in February 2010*
- EU-TECH-08 – 2008-2012 – Improvement of quality production and yield assurance by means of irrigation
- EU-TECH-09 – Development of a complex technology for bio-converting and utilisation of the by products of maize and rape as energy plants
- Norwegian Fund - Development of the bio-ethanol based production of sweet sorghum in the North Great Plain region

One of the main objectives of ILTR is to achieve such new results which enable the scientific foundation and development of agricultural systems in accordance with environmental protection which is the most important issue besides efficiency.

The research programme supports the complex analysis and computerized modelling of agro-ecological, biological and cultivation technology effects. The results facilitate the improvement of agronomic and ecologic efficiency of cultivation technologies ensuring that the interventions are environment friendly and they comply with the requirements of long-term sustainability.

The other main objective of the planned research programme is providing the scientific basis for rational land utilization, landscape design, environmentally sound management and the development of a proper, sustainable agriculture in the Tiszántúl region which complies with the soil preservation regulations. Therefore the fundamental issues are sustainable land utilization, rational area utilization system and the development of a balanced and stable land utilization structure which is in harmony with the agro-ecological conditions of Hungary. Furthermore, the preservation and improvement of the natural assets, landscape, soil and water resources is also an essential issue.

The infrastructure and equipments of the training, research and educational facilities have been improved and upgraded in the last 10 years by means of various grants, but the increase of demands always got ahead of the development of possibilities, therefore the current equipment – with few exceptions – does not fulfil the expectable conditions for a modern R&D environment. The insufficient infrastructural background makes the intensive co-operation with the participants of economy and the labour market very difficult and also hinders ILTR in the elimination of its backwardness and its permanent integration into ERA. The lack of a proper innovative environment and international co-operations also hinder ILTR in testing and applying the latest products, technologies and methods.

The rapid development of information technology requires ILTR to obtain and transfer up-to-date knowledge towards the production and entrepreneurial sector. Continuous development of knowledge and experience is essential in everyday practice; this can only be guaranteed by the involvement of internationally acknowledged research institutions of the EU.

The following **SWOT analysis** provides a comprehensive picture of the current situation of ILTR and the possibilities and threats of the future.

Strengths

- Excellent researcher and educational basis
- ILTR has a significant role in the training of young experts with BSc, MSc and PhD degrees
- The interdisciplinary character of the University of Debrecen
- Solid experience in project management
- A long history of successful projects and applied research on the field of precision cultivation
- Strong research and entrepreneurial co-operations
- Advantageous geographical situation, significant research activities in the surrounding countries (Romania, Bulgaria, Ukraine, Serbia)
- In a national comparison the infrastructure of ILTR (e.g. working environment, research infrastructure, etc.) can be considered good
- The field of research (precision cultivation) is very innovative

Weaknesses

- Due to insufficient financial sources, ILTR is unable to develop its human resource background
- ILTR is situated in a convergence region within the EU
- Low level of co-operation with research entities from the western regions of EU
- It is difficult for ILTR to attract high-quality researchers from abroad, however the long-time employment of foreign experts would be a significant added value
- Although the infrastructural background of ILTR is relatively good, it is still partially obsolete and insufficient for carrying out more advanced, EU level research activities

Possibilities

- Production of marketable scientific results; further development of multidimensional connections with the entrepreneurial sector
- Effective adaptation of results gathered in higher education into practice
- Development of co-operational activities
- The planned employment of the new researchers would be an important addition to the current scientific composition of ILTR
- Strengthening of international information flow
- Getting acquainted with research trends, processes (exchange of research and experience) by means of knowledge transfer and exchange of experience carried out jointly with the partner institutions
- Improvement of the infrastructural background would enable ILTR to carry out more advanced research and it also would support the better co-operation with other research entities and SMEs
- Preparation of joint research proposals together with the partner institutions of the current proposal and additional research entities

Threats

- Slow spread of environmental friendly technologies, technical advisory system based on old-fashioned technologies
- Slow spread of innovation results
- Decrease of the current human resource capacities (low monthly payments, better employment conditions and possibilities abroad)
- Low attractiveness of becoming a researcher for young experts due to the lack of competitive conditions
- Uncertainty of the sustainability of the research activities (decreasing financing and subsidization possibilities, reduction of R&D co-operations with the entrepreneurial sector)
- Without appropriate financial sources, professional services and technical advisory system producers using obsolete, non-environmental conscious technologies will lose market positions.

Generally, the importance of regional development can be described on the basis of EU requirements. In the regional policy of the European Union, it is very important to strengthen the regions for such reasons as economies of scale, rationalization, power policy and ethnicity. Based on the principle of subsidiarity, regions became the beneficiaries of EU resources by the European integration processes, the implementation and strengthening of the regional policy built on local resources.

In the last decade, the relative circumstances of regions hardly changed in comparison with each other. As for absolute numbers, there is an increasing hole between the individual country parts, the existing regional differences do not really decrease, despite the efforts made.

In accordance with the EC regulation No. 2078/92 on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside, the most important objective of the Hungarian agriculture is to develop a farming practice which is based on the sustainable usage of natural resources, the preservation of natural values and biodiversity, the protection of landscape values and the production of healthy products¹.

It is important for the country to implement a modern agro-environmental management that makes it possible to develop a course of modernization which is based on the utilization of environmental-friendly, energy-saving and wasteless technologies, as well as innovative developments of high value that make use of the comparative advantages and expertise of the country.

“New Hungary Regional Development Strategic Plan” (2007-2013) intends to continue these objectives, giving greater emphasis to sustainability aspects and innovation oriented modernization. It is important to enhance the receptivity of the sector towards innovation and new methods. The background of this is the development of the system and infrastructure of innovative services, establishment of the IT network and the operation of IC technologies.

The unique natural endowments of Hungary, its climatic conditions, the amount and quality of soil – total agricultural land (5,9 million hectares) is 63% of the total area of the country – are the bases for the excellent results in the case of most crops².

¹ Nagy, J. Multifunctional agriculture In: Baranyi, B., Nagy, J. (ed.) Regional development, agriculture and regionality in Hungary. Debrecen: DE ATC, 2006. pp. 191-206.

² Nagy, J. Evaluating changes of land use and property structures in Hungary. In: Cockx L., Van Meirvenne M., Tóth T., Hofman G., Németh T. (szerk.) Monitoring space-time dynamics of soil chemical properties to improve soil management and environmental quality. Gent: University of Agriculture, 2005. pp. 29-41.

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Fieldsend A.F., Nyizsalovszky R., MacAskill J.A.: Rural renaissance – a Strategy for integrated rural development in Eastern Central Europe. In: Bulletin of the University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca. Vol. 60/2004. ISSN 1454-2832. pp. 7-13. (2004)

Owing to its geographical situation Hungary is in the potential leading edge of Europe from the aspect of agricultural production. Soil quality, low level of chemical materials, and the fact that Hungary is either to northeast or the southeast cultivation area of many crops are comparative advantages¹. Besides, the century-long traditions, the developed intellectual potential and the central situation (including the closeness of the new eastern markets) mean a competitive advantage from a socio-economic point of view.

Agriculture had a share of 3,6%, while agro-business had a share 13% from the national economy GDP in 2006. The significance of agriculture is also shown by the fact that it employs 4,9% of the actively working population; this number is 10,2% food industry is also included.

North Great Plain Region is a real agricultural region, because 22% of the total soil amount, 23% of livestock production and 60% of fruit production is to be found here and it gives 19% of the agricultural GDP.

According to the above, it is certain that the sector is important and of strategic significance for the country, because every citizen is a beneficiary of the production carried out here. Therefore, Hungarian agriculture – resulting from its multifunctional role – is a far more important sector of national economy than its contribution to GDP. The sector plays an important role in the exploitation of the advantageous ecological conditions, rural development and the employment of the rural population. Its stabilizing role resulting from its permanently positive balance in external trade is of great significance.

The creation of the conditions of precision farming and the protection of soil fertility is an important objective of agriculture today. Precision agriculture covers more than the definition of traditional production technology, because it is a complex system that integrates the biological, technical and economic factors of crop production with the newest achievement of information technology, while improving the quality of life (supervised and quality food, forage) and laying the foundation of the sustainable development of agro-economy and the rural areas². The nutrient balance of the country has been negative for nearly one and a half decades. This results in the gradual degradation of soil fertility³. A further requirement is the harmonization of the objectives of environmental protection and production that is satisfying plants' needs, maintaining soil fertility and imposing the most minimal load on environment⁴. The only way to meet this requirement is to consider production site conditions and to carry out production site-specific production technology. The course of precision farming methods becoming more widespread has a favourable effect on the conditions of the environment, the threat towards soil and water reserves is decreasing, the quality of life is improving and the population's feeling of comfort also increases. The aim of precision crop production is to optimize the utilization of available renewable natural resources while reducing environmental damages⁵. A new approach is needed in cultivation, soil improvement, nutrient management, crop protection and the handling of crop residues.

The area of agriculture and rural development directly affects nearly sixty percent of the population, whereas it affects all of them indirectly through the quality and price of food and the conditions of the environment. The actors of these areas do not belong to the economically strong organizations.

¹ **Nagy J., Dobos A.**: Quality cultivation by applying a geoinformation system. In: Pepó P. (szerk): Beginning of a new era in the Hungarian agriculture, basics of modern cultivation (2005) 22-29.

² **Dobos A., Nagy J.**: Maize production in precision agriculture. In: Simon L. (szerk.) Innovation and utility in the Visegrad Fours. Nyíregyháza, (2005) 379-385.

³ D'Haene K, Magyar M, De Neve A, Pálmai O, **Nagy J.**, Németh T, Hofman G. Nitrogen and phosphorus balances of Hungarian farms. EUR J AGRON 26: 224-234 (2007)

Víg R., **Dobos A.**, Pongrácz Z.: Analysis of soil heterogeneity in the trial fields of Hajdúság In: Nagy J., Dobos A. (ed.) Environmentally sound cultivation – quality production. DE Agrártudományi Centrum, Debrecen, 2006, pp 186-195.

⁴ **Dobos A.**, Pázmányi S. Nyizsalovszky R.: Planning of landscape management and land use conversion at the Tiszaroff reservoir. In: Buletin of the University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca. Vol. 60/2004. ISSN 1454-2832. (2004)

Dobos A., Széles A.: Possibilities of a change of land use in the surroundings of Tisza river In: Baranyi B. (ed.) Establishment of cross border relations and the regional aspects of agriculture in the eastern edge of the EU. HAS Centre of Regional Studies, Debrecen, (2005) 185-195.

⁵ **Dobos A.**, Víg R., Pongrácz Z.: Research activities establishing an environmentally sound nutriment management in 'Tiszántúl' In: Baranyi B. (ed.) Regional development, agriculture and regionality in Hungary MTA HAS Centre of Regional Studies, Debrecen, 2006, pp 315-329.

Víg R., **Dobos A.**: Comparative analysis of nutriment data in different trial fields. Agrártudományi Közlemények, 2006. 22. pp. 85-89.

The majority of them fights significant economic problems and are forced to make decisions on a daily basis because they lack any strategy¹.

According to our experiences, effective and rapid introduction of new technologies and methods in the agricultural sector is difficult. Another hindering factor of the effective introduction of innovation is the mistrust of agricultural producers towards any new method. This is further weighted by the slow information technology possibilities and the increased (but not satisfied) demand for information.

Management of the problems is highly supported by the integration of IT innovations into farm management and the decision-making of integrators and also into the work of rural and regional development organizations.

The planned research activities which could be realized after the research potential improvement financed by REGPOT-2010-1 have a unique solution in Europe for these factors. The aim of the research potential improvement is the establishment, installation and launch of a parallel working, information and technical advisory system, which would be the basis of a Technical Advisory Centre (TAC) to be established later. The producers who use the system will be parts of a qualified cultivation system which improves the market access of the produced qualified products; monitoring of production will also be realized. Quality cultivation requires the application of environment friendly and effective cultivation technologies, the continuous observation of agricultural environment, and the prediction of unfavourable effects (pathogens, pests, internal water, etc.). The system is suitable for the detailed plot-by-plot analysis of climatic conditions and the spatial-temporal analysis of cultivation technology parameters.

¹ Harsányi E., Széles A., Harsányi G.: Development of property structure in Hungary In: Baranyi, B. (ed.) Regional development, agriculture and regionality in Hungary MTA HAS Centre of Regional Studies, Debrecen, 2006, pp 221.-229.

Objectives

It is a great challenge for the Hungarian agriculture and especially the rural territories to adapt to the regulations of the European Union and the demands of the XXI. Century.

The short-term objective is obvious, because it is to improve the infrastructural and human resource background and the related research potential of ILTR. The exact measures of these activities are described in detail within the relevant sections of this proposal.

The long-term objective is the result of the infrastructural development, and it is not possible to be achieved without it.

The planned future research programme has a dual aim in the radically changed agricultural environment. On the one hand, it intends to increase the efficiency of agricultural production by utilizing comparative advantages; to make producers' competitive, market and income positions safer and more favourable and to adapt environmental friendly farming in the region. On the other hand, the objective of the program is to develop a multi-functional agricultural practice aiming at sustainability on areas that are less suitable for economic development, domestic and international market expansion.

The developed system is suitable for the detailed, plot-scale analysis of production site circumstances and yield, as well as the spatial-temporal evaluation of production technology parameters. The more accurate and more efficient assessment of our environment's conditions provides opportunity for marking off the main degradation processes in agriculture and for the complex evaluation of their consequences; the analysis of their causes and based on all this, the realization, prevention, reduction and elimination of them.

Therefore, **the strategic objective** of the project is to – by means of the infrastructural development – enable the creation of a research-based technical advisory system (and TAC) which will support both agricultural producers and policy-makers. The establishment of TAC would be a serious step for a higher level integration into ERA, and would be a significant improvement of the research community of the region and the academic society of Hungary as well. In order to improve the research potential of ILTR to the desired level, an Action Plan has been elaborated which includes the coherent set of the 5 measures indicated in the REGPOT-2010-1 call, as follows:

Exchange of know-how and experience:

Reception of foreign experts and visits in the partner institutions will be carried out to ensure knowledge-transfer and exchange of know-how, experience and best practices.

Results:

- 1 week stays in the 6 foreign partner institutions
- In the course of the two-way secondments we plan to receive experts from the partnering institutions for periods that vary between 2 weeks and 1 month (depending on the availability experts and the project stage). See details at the relevant Work Package description
- 1-2 month stays of four the WP leaders and one of the new experts in the partner institutions (for detailed description see WP3)
- 1 month stays of 1 PhD student in each partner institution (except for the HAS CRS)

Recruitment of incoming experienced researchers:

Improvement of the research conditions from the side of human resources by means of employing 2 new experts after the first six months of the project in order to assure proper professional standards.

Result: 3 year contract of employment with 2 new researchers.

Improvement of research infrastructure, purchase of equipment:

The development of infrastructure would be realized based on the already existing equipment. As a central element of the purchase the improvement of the GIS laboratory is necessary.

Result: Installed and operational new equipments (listed in the relevant sections of the proposal).

Organisation of workshops and conferences:

In order to assure knowledge transfer of an appropriate level the organisation of two international level conferences in Debrecen and the invitation of experienced and acknowledged lecturers is necessary.

Result: Organization of two scientific conferences.

Dissemination and publication of research achievement; communication activities:

Regular publication of the obtained experience and the achieved results in the course of the research; information of the public in order to improve the visibility of the project and the scientific results.

Result: Bilingual website, leaflets, annual bulletin, CD-ROMs, announcements of the events, participation on national and international conferences and events, mass media appearances, etc.

1.2 Quality and effectiveness of the support mechanisms, and associated work plan

According to the SWOT analysis, the main objective of this proposal is to overcome the weaknesses mentioned above, by means of improving the strengths in order to utilize the opportunities. As a result of the following – SWOT-based, objective oriented – work plan ILTR will reach the level of research infrastructure and knowledge which is necessary to step forward towards more advanced joint research activities.

In order to successfully implement the planned tasks it is necessary to follow the following work plan which consists of 5 Work Packages (WPs). These WPs represent the logical phases that are essential for the efficient project implementation. Figure 1 shows the schedule and the deliverables of the project in a Gantt chart, while later Figure 2 shows the graphical presentation of the project components and their interdependencies.

The project management (**WP1**) consists of the Project Coordinator (PC), the WP leaders, a Communication Coordinator (CC), an Advisory Committee (AC) and a Steering Board (SB). WP1 will provide every general management activity including both strategic and daily management of the project and the obligations in order to ensure coherence and efficiency for the entire project.

The main purpose of the REGPOT-2010-1 call and this proposal is to improve the research potential of research institutions situated in convergence regions. Therefore **WP2** and **WP3** jointly serve as the instruments for reinforcing the infrastructural and human capacities of ILTR.

The purchase of equipment (WP2) is essential for ILTR, because even if it possesses a wide range of tools and equipment, the upgrade of these and the establishment of a GIS laboratory is essential. ILTR has the most equipped GIS laboratory of the region. Its hardware (graphic workstations, data and map server, Contex Chameleon Tx 36" scanner, Encad T-200 A0 printer, field data collectors, Javad Legacy geodetic GPS, Trimble ProXH GPS, automatic meteorological stations, TDR probes, SPAD-502, Infratec 1241, etc.) and software technology (ArcGIS 9.x, ARC/View 3.3, ArcPad 7.0, ArcPad Application Model Builder, ERDAS Imagine Prof 8.x, Autodesk Land Desktop, Autodesk Survey, Autodesk MapGuide, Autodesk Civil Design, Midas Gis-Lite), as well as its researcher basis guarantees a high level of expertise and knowledge. However, the proposed research activities require the further improvement of our research capacities and potential both from the point of view of infrastructure and human resources.

As for human resources, **WP3** plans to implement the relevant activities for enhancing the skills and knowledge of the ILTR staff. One of the most important components of WP3 is the hiring of 2 new, experienced researchers. The extension of staff with new experts will contribute to the improvement of the research quality and standards of ILTR.

Another key activity is the two-way secondments of our partner institutions in the course of which our experts (the WP leaders and one of the newly hired experts) will have the opportunity to observe the scientific work carried out there and the incoming experts will also share their scientific experience with our staff. The length of these secondments will vary between 2 weeks and 2 months depending on the availability and the timeframe of the involved researchers from both sides. One of our PhD students will also stay for a longer (1 month) period in order to gain additional knowledge by participating in the everyday work of the given partner institution. This practical experience will act as significant added value in the PhD student's career development.

The activities of WP3 also cover the training of the relevant staff to make them able to use the newly purchased equipment.

The communication and dissemination activities (**WP4**) will help ILTR to become more visible in the ERA, and in the general research community. This is a dual objective, because not only ILTR as a research facility needs to be highlighted, but its current and upcoming scientific activities and results. The results we plan to achieve by the improved capacities enabled by the massive infrastructural development will have a major significance locally, regionally and on the level of ERA as well. These achievements must be disseminated to the public and to the research community.

Two scientific conferences will be organized where experts from the partner institutions will give lectures on the field of land use, precision agriculture, regional development and GIS. The staff of ILTR also plans to attend national and international events in order to introduce the institution and the project to the wider (national and international) public. Through the continuous presence in the written and electronic media transparency of the project will also be ensured.

In the course of **WP5** activities a database will be created which summarizes all the relevant information available for ILTR and its networking partners on agricultural regional development and GIS, including methodologies, research results, collection of relevant internet links, etc.

By means of the implementation of the above summarized activities ILTR plans to reach a higher infrastructural and scientific level which will enable it to be a significant part of ERA, to contribute to regional capacity building and to participate in further FP7 projects. At the end of the development, ILTR's objective is to launch its technical advice activities, to support the local and regional agricultural stakeholders.

[illegible]

*** Conferences are about the evaluation of the results achieved by far and the agenda and tasks of the rest of the project. These would also be informative events for the press with lectures and transparent activities. There would also be AB and SB meetings

Note: **D4.7** is not only delivered on the indicated occasions, but the exact date of the rest of the deliveries is currently unknown, therefore they are to be determined later.

Table 1.2 a: Work package list

Work package No ¹	Work package title	Type of activity ²	Lead participant No ³	Lead participant short name	Person-months ⁴	Start month ⁵	End month ⁵
1	Project management	MGT	1	ILTR	22	1	36
2	Infrastructural development	SUPP	1	ITLR	9	3	16
3	Improvement of the human resources	SUPP	1	ILTR	115	2	36
4	Dissemination and communication	SUPP	1	ILTR	17	1	36
5	Database development	SUPP	1	ILTR	12	4	36
		TOTAL			175		

¹ Workpackage number: WP 1 – WP n.

² Please indicate one activity per work package:

SUPP = Support activities; MGT = Management of the consortium; OTHER = Other specific activities, if applicable.

³ Number of the participant leading the work in this work package.

⁴ The total number of person-months allocated to each work package.

⁵ Measured in months from the project start date (month 1).

Table 1.2 b: Deliverables List

Del. no. ¹	Deliverable name	WP no.	Nature ²	Dissemination level ³	Delivery date ⁴
D1.1	Report on project progress	1	R	PP	12
D1.2	Report on project progress	1	R	PP	24
D1.3	Financial report	1	R	PP	Delivered any time on the request of the EC
D1.4	Final report	1	R	PP	36
D2.1	Public procurement tender for the purchase of equipment	2	O	PU	3
D2.2	Report on the finished public procurement and purchase	2	R	PP	12
D2.3	Report of the installed and fully functional equipment	2	R	PP	14
D2.4	Report on the completed training	2	R	PP	16
D3.1	Report on the initial visit	3	R	PP	2
D3.2	Report on the hiring of the researchers	3	R	PP	2
D3.3	Reports on the activities and performance of the hired researchers in every 6 months	3	R	PP	6, 12, 18, 24, 30, 36
D3.4	Reports on the secondments of the experts from the partner institutions	3	R	PP	9, 15, 21

¹ Deliverable numbers in order of delivery dates. Please use the numbering convention <WP number>.<number of deliverable within that WP>. For example, deliverable 4.2 would be the second deliverable from work package 4.

² Please indicate the nature of the deliverable using one of the following codes:

R = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

³ Please indicate the dissemination level using one of the following codes:

PU = Public

PP = Restricted to other programme participants (including the Commission Services).

RE = Restricted to a group specified by the consortium (including the Commission Services).

CO = Confidential, only for members of the consortium (including the Commission Services).

⁴ Measured in months from the project start date (month 1).

D3.5	Report on the scientific visits in the partner institutions	3	R	PP	6, 12, 18, 24, 30
D3.6	Reports of the PhD students on the period spent at the partner institutions	3	R	PP	6, 12, 18, 24, 30
D3.7	Reports on the secondments of the ILTR staff	3	R	PP	7, 12, 19, 24, 30
D3.8	Reports on the participation on national and international events/conferences	3	R	PP	depends on the exact date of the events
D4.1	Report on kick-off meeting	4	R	PP	1
D4.2	Design and initial documentation of the website	4	O	PP	1
D4.3	Completed and operational website	4	O	PU	2
D4.4	Overall report on the 1 st conference	4	R	PP	14
D4.5	Overall report on the 2 nd conference	4	R	PP	25
D4.6	Reports on the participation on events/conferences	4	R	PP	depends on the exact date of the events
D4.7	Announcement of the upcoming events and publication of their results in the mass media	4	O	PU	depends on the exact date of the events
D4.8	Production of leaflets and CD-ROMs	4	O	PU	1, 18, 36
D4.9	Report on the final meeting	4	R	PP	36
D5.1	Report on the preparatory actions	5	R	PP	12
D5.2	Completed and operational database	5	O	PU	13
D5.3	Final report on the database at the end of the project	5	R	PP	36

Table 1.2 c: List of milestones

Milestone number	Milestone name	Work package(s) involved	Expected date ¹	Means of verification ²
M1.1	Progress reports	1	12, 24	Completed and submitted reports
M2.1	Purchase of the equipment	2	12	Documentation of the closed public procurement procedure, and the purchase (invoice, etc.)
M2.2	New equipment installed and operational	2	14	Report of the technical staff on the successful installation
M3.1	General visits at the partner organisations at the beginning of the project	3	2	Report on and minutes of the meetings, documented costs of the participants (travel, accommodation, etc.)
M3.2	2 new hired researchers	3	2	Signed contract of employment of the newly hired experts
M3.3	Scientific visits at the partner organisations + 1 month stay of the PhD student	3	6, 12, 18, 24, 30	Report on the activities of the ILTR experts and the PhD student; documented costs (travel, accommodation, etc.)
M3.4	Secondments of the ILTR staff	3	7, 12, 19, 24, 30	Report on the activities of the seconded ILTR experts; documented costs (travel, accommodation, etc.)
M3.5	Reception of experts from the partner institutions	3	9, 15, 21	Report on the stay and activities of the experts; documented costs (travel, accommodation, etc.)
M4.1	Meetings (kick-off, scientific conferences and final)	4	1, 14, 25, 36	Report on and minutes of the meetings, documented costs of the participants (travel, accommodation, etc.)
M4.2	Launch of the website	4	2	Working and accessible website
M5.1	Database installed and operational	5	13	Working database accessible from the project website

¹ Measured in months from the project start date (month 1).

² Show how you will confirm that the milestone has been attained. Refer to indicators if appropriate. For example: a laboratory prototype completed and running flawlessly; software released and validated by a user group; field survey complete and data quality validated.

Table 1.2 d: Work package description

Work package number	1	Start date or starting event:	1
Work package title	Project management		
Activity Type	MGT		
Participant number	1		
Participant short name	ILTR		
Person-months per participant:	22		

Objectives

The content of this WP is mainly the strategic (long-term) and everyday (short term) management of the project. The main objective of the WP is to provide and ensure the sound implementation of the project in terms of e.g. efficiency and consistency. Its most important tasks:

- Ensure the most effective coordination and execution of the project activities in terms of finance, administration and dissemination
- Monitoring the progress and quality of the other WP activities
- Communication with the European Commission about the progress and status of the project
- Communication with the networking partners

Description of work

WP1 covers the overall co-ordination tasks of the project. In the course of WP1 the management of the project will continuously make sure the step-by-step implementation of the planned activities. In order to perform an efficient monitoring and a professional management approach an Advisory Committee and a Steering Board will be set up. The AC will consist of one excellent expert from every networking institution and ILTR. Its task is to objectively monitor the project progress and make joint suggestions for the given activities in order for the project to be implemented in harmony and perfect unison with every partner. The Steering Board will consist of independent experts from the local and regional level. Their task is to help creating a long-term strategy for the project to ensure its sustainability.

WP1 will perform the overall financial and administrative management e.g. control spending of the grant, handle the incoming invoices and preparing the necessary documentation in the case of an audit from the EC.

Internal communication among the networking partners and the EC will be carried out also in the scope of WP1. There will be a Communication Co-ordinator (CC) who will be responsible for everything related to communication issues. WP1 will produce reports of all the relevant information related to project progress and output quality.

Kick-off meeting and final meeting will also be organized, but they are part of WP4, because of their dissemination nature.

Deliverables

D1.1 First report on project progress (month 12)

D1.2 Second report on project progress (month 24)

D1.3 Financial report (Delivered any time on the request of the EC)

D1.4 Final report (month 36)

Work package number	2	Start date or starting event:	3
Work package title	Infrastructural development		
Activity Type	SUPP		
Participant number	1		
Participant short name	ILTR		
Person-months per participant:	9		

Objectives

The main objective of this Work Package is to upgrade and improve the S&T infrastructural background of ILTR in order to make it suitable and prepared enough to carry out the planned research and technical advisory activities and the establishment of TAC in the future.

Description of work

- At the beginning of the project a public procurement procedure for purchasing the required technical tools will be initiated. The exact type and specification of the tools to be purchased will be determined with the assistance of the networking partners.
- After the purchase the new equipment will be installed
- After the installation the experts of ILTR will participate in a training that will help them become fully familiar with the installed the equipment. Although the training is part of the improvement of the human resources of ILTR it is implemented as part of WP2, because it is closely related to the purchased equipment.
- Reports will be prepared on the successful public procurement procedure and purchase and also on the installation of the purchased equipment

Deliverables (brief description and month of delivery)

- D2.1 Public procurement tender for purchasing the necessary equipment (month 3)
- D2.2 Report on the finished public procurement and purchase (month 12)
- D2.3 Report of the installed and fully functional equipment (month 14)
- D2.4 Report on the completed training (month 16)

Work package number	3	Start date or starting event:	2
Work package title	Improvement of the human resources		
Activity Type	SUPP		
Participant number	1		
Participant short name	ILTR		
Person-months per participant:	115		

Objectives

The objective of the Work Package is to improve the level of knowledge and skills of the ILTR staff in order to enhance the human resource background of the research potential of ILTR. In order to realize this objective the following activities will be performed:

- a) 2 new experts will be hired to work permanently at ILTR
- b) Short visits of ILTR experts at the partner institutions at the beginning of the project
- c) Training of the ILTR staff regarding the new equipment
- d) Scientific visits of ILTR experts and longer (1 month) stays of a PhD student at the partner institutions
- e) Two-way secondments
- f) Reception of experts at the two scientific conferences in Hungary
- g) Participation at relevant international fairs, events

Description of work

- a) ILTR plans to permanently hire two experienced researchers from the field of regional development and GIS in order to enhance the expert composition of its staff. ILTR intends to make sure to set the highest standards when extending its staff in order to ensure that the expertise and excellence of the newly hired experts will provide a significant added value for ILTR. Therefore, the following highly qualified experts will be hired starting from month 2:

Dr. József Szabó, senior member of the Soil Science and Agro-chemistry Research Institution of the Hungarian Academy of Science, Budapest. His research fields:

- Methodological elaboration of the Environmental Conflict Mapping conforming to the European standards
- Application of GIS and remote sensing in the mapping of soil degradation processes and cultivation
- Construction of complex GIS systems for soil science (AGROTOPO, HunSOTER, SOVEUR etc.) in regional scale
- Design of large-scale GIS applications supporting agro-environment management

Dr. Dénes Sulyok, developer engineer at the KITE Agricultural Commercial and Service Provider PLC. His research fields:

- Elaboration and practical application of a precision nutriment management method
- Application of environment friendly cultivation systems in precision agriculture
- Development and adaptation of environment friendly plant protection procedures

The long-term objective in terms of the career development of the above researchers is

certainly to keep them after the 36 months of the project duration as well. ILTR intends to carry out its current and planned activities in a sustainable way, which will ensure the long term employment of its existing and newly hired staff.

- b) This visit will be an initial introductory visit, when the experts of ILTR travel to the partner institutions to become more familiar with their capabilities, resources, equipments and research activities. This occasion will also be suitable to start concrete discussions about joint research projects to be elaborated and submitted to later FP calls. The length of the visit would be approximately 2 days per partner institution and the whole visiting trip would be completed within 12-14 days.
- c) The staff of ILTR requires training after the installation of the new equipment. It will take place at ILTR involving experts from the company the equipment was purchased from. The experts of ILTR are well experienced on this field, but the training will accelerate the initial phase of the infrastructural development by helping them acquire the necessary knowledge for the sound operation of the equipment. As ILTR – beside research – is also an educational facility, the trainings will be open for students of the University Of Debrecen Centre Of Agricultural Sciences and Engineering who are interested in the operation of the equipment in question.
- d) Scientific visits at the foreign partner organizations will take place in a 6 month rotation. In months 6, 12, 18, 24, 30 the experts and a PhD student of ILTR will visit the networking organizations. The visits will last approximately one week for the senior staff, and the PhD student will stay for a further 1 month period to participate in the practical work carried out in the given partner organization. Beside the observation of the technological and professional work the senior scientists will learn about the running research projects of the partners. These activities are expected to support the establishment of future scientific co-operations within FP or other research projects and to stimulate twinning between ILTR and the partners with similar research activities. Such study visits of our senior research staff and the PhD student in EU research institutions are the most important and effective methods for their personal development and consequently for the overall development of ILTR as well.
- e) This activity may provide the most important added value of the project (beside the infrastructural development). The two-way secondment of staff is the key of acquiring the additional knowledge and expertise required for the achievement of our main goal: the improvement of ILTR's research potential and human infrastructure. In the course of the two-way secondments four of our experts and WP leaders (Prof. Dr. János Nagy, Dr. Endre Harsányi, Dr. Tamás Rátonyi and Dr. Attila Dobos) and one of our newly hired experts (Dr. Dénes Sulyok) will be sent to our networking partners for 1 or 2 month secondments in order to observe their scientific work and gather new experience and information regarding the general application of GIS methods and their integration of these into land use, cultivation and regional development processes. The profiles of the mentioned experts can be found in Section 2.1 of this proposal (the profile of Dr. Sulyok is found above). The scientific secondments of the ILTR experts will take place together with the scientific visits of the rest of the senior staff (point 'd)'), only the above mentioned seconded staff will stay for a longer period (1 or 2 month) at every visit in months 6-7, 12, 18-19, 24, 30

As part of the two-way secondments ILTR also invites the experts of the partner institutions to spend time in Debrecen observing the scientific processes carried out at ILTR. The suggestions of the foreign experts based on their experience and expertise will support ILTR in achieving its objective to become a much more improved institution with an enhanced research potential. The help of the experts will also provide essential added value that can be adopted by ILTR and integrated into its future research activities. The activities also cover lectures given by the foreign experts to the students of UD. The scientific visits of the partner institutions will take place in months 9, 15, 21. The experts will spend their secondments in three segments for a reason. Each segment

will be based on a certain research field; therefore the relevant experts of one field will spend their secondment at ILTR together. The experts participating in secondments on behalf of the partner institutions are the following (classified by research fields):

GIS (month 9)

- **UT:** Dr. Volker Hochschild Prof. Dr. Sebastian Kinder Dr. Jan Kropacek Dr. Michael Märker (1-4 weeks)
- **UV:** Prof. Dr. Andrew U. Frank and Dr. Gerhard Navratil (1-2 weeks)
- **FSU:** Prof. Dr. Wolfgang-Albert Flügel, Dr. Peter Krause, Dr. Sven Kralisch, Dr. Manfred Fink (1 week)

GIS and land use (month 15)

- **IGSO:** Jerzy Bański and Marcin Mazur (1 month)

Land use and regional development (month 21)

- **GU:** Prof. Jacques Viaene (1 month)
- **UL:** Dr Gerard McElwee (1 month)

- f) The two scientific conferences to be organized in month 14 and 25 are also parts of WP4, as they are instruments of communicating and disseminating the project results. The reason why they are also mentioned here in the description of WP3 is that the conferences will also be a possibility for the ILTR staff to obtain additional information about the research field of regional development and precision agriculture by means of the lectures given by the incoming experts of the partner institutions.
- g) In order to remain up-to-date about the latest innovations of precision agriculture, the staff will participate fairs and events overseas (USA) and in Europe.

Deliverables (brief description and month of delivery)

D3.1 Report on the initial visit (month 2)

D3.2 Report on the hiring of the researchers (month 2)

D3.3 Reports on the activities and performance of the hired researchers in every 6 months (months 6, 12, 18, 24, 30, 36)

D3.4 Reports on the secondments of the experts from the partner institutions (months 9, 15, 21)

D3.5 Report on the scientific visits in the partner institutions (months 6, 12, 18, 24, 30)

D3.6 Reports of the PhD students on the period spent at the partner institutions (months 6, 12, 18, 24, 30)

D3.7 Reports on the secondments of ILTR experts at the partner institutions (7, 12, 19, 24, 30)

D3.8 Reports on the participation on national and international events/conferences (depends on the exact date of the events)

Work package number	4	Start date or starting event:	1
Work package title	Dissemination and communication		
Activity Type	SUPP		
Participant number	1		
Participant short name	ILTR		
Person-months per participant:	17		

Objectives

- To transfer the results and knowledge to the relevant target groups of planned future research activities in order to accelerate and maximize the speed of the project impacts
- To improve the international acknowledgement, visibility and competitiveness of ILTR and introduce it as an excellent destination for PhD students and young researchers for exchange programmes as well as an attractive partner for joint research co-operations
- To inform the target groups and the public about the project results and the research activities to be carried out in the future
- To ensure sustainability of the project results (scientific results, TAC, career development of the newly hired experts) by means of creating joint activities with the target groups (commercial companies, agricultural producers, decision-makers, etc.)

Description of work

Communication and dissemination cover the full length of the project, because transparency is a key issue within the implementation of a modern project.

WP4 will play a key role in supporting the flow of information related to project tasks, objectives, outputs and to the promotion of ILTR's potential, capabilities, experience, vision and mission. WP4 will act in close connection with the other WPs as it will inform the public about their activities. As the most significant target groups of this field of research are agricultural producers, integrators, regional, and local decision-makers, researchers, etc. the key task of WP4 is to reach these groups and stakeholders and provide them sufficient and relevant information on the project results.

The tools for carrying out the tasks of WP4 are the following:

- Activities related to the internet and the official project website
- Tangible outputs that help spread information
- Organization of events (Kick-off meeting, two scientific conferences, final meeting) and participation on events
- The use of mass media tools to promote the project and its results

* * *

- The official website will be launched to be a source of downloadable project documents and to inform the public. The website will function as a contact point informing the public about events to be organized, the activities of ILTR, and the documentation of past events (reports, lectures, photos, etc.), the project progress, related publications, ILTR infrastructure, international connections, staff profiles and contacts, research agenda and also career offers if available. Beside the scientific research material, non-expert research material will also be published as well to reach the widest group of users possible to raise public awareness about the project relevance and contribution to a more sustainable land utilization and regional development.

Additional features of the website will be:

- Electronic newsletter for the registered users
- On-line questionnaires to provide data for the ILTR database
- Frequently Asked Questions service (FAQ)
- Users will be able to add comments and provide feedback about the overall work of ILTR, the outcome, experience and opinion on events, the project, and the carried out research activities, etc.

The website will be regularly updated with new documents, reports, news and other relevant downloadable material to provide the most up-to-date information for users interested in it.

2. Under tangible outputs we mean communication tools like e.g. annual bulletin, leaflets and CD-ROMs. These tools can be utilized to be an alternative for effectively spreading the data and information WP4 intends to transfer to the target groups. Printed leaflets and CD-ROMs (either general ones introducing the overall project or created exclusively for and about a given event, for example the two scientific conferences) will help ILTR reach segments of the target groups which are not familiar with the internet, but these media is also to be handed out at the relevant events organized by the ILTR or the ones it participates in.
3. For ensuring the possibility for every project participant including the SB to meet in person at the same time, 3 meetings will be organized. At the beginning of the project (month 1) a kick-off meeting will take place in Debrecen. Then two scientific conferences will be organized in month 14 and 26 in order to – beside their purposes already listed above in point f) of the description of WP3 - provide possibility for the partners and the SB to evaluate the results of the first half and discuss the agenda for the second half of the project. Meeting the representatives of the partners will help the SB make suggestions for a sustainable long-term strategy for the project. The scientific conferences will also be perfect occasions to inform the public about the project progress. In month 36 a final meeting will take place also in Debrecen in order to evaluate the successfulness of the project and to lay the foundations of further co-operations.

Participation in events is also a part of WP3, because as a tool of improving human resources it refers to the aspect of learning something new from other institutions at such events. However, the other aspect of such activities is for ILTR to introduce itself to the research community and the general public and improve its visibility. This aspect mainly covers domestic events, experts' meetings, conferences, and for example the "Farmer Expo" organized by UD CASE.

4. Naturally, the proposed project intends to utilize the communication potential of various mass media sources. The announcement and short reports of each event will be spread to the public via newspapers, radio, and TV. We intend to invite local and regional TV channels to film the main events of the project and make interviews with the members of management to raise public awareness on the project objectives and outcomes.

The printed media has another role as well. We intend to publish articles in various domestic and also international scientific journals with high impact factors.

Deliverables

D4.1 Report on the Kick-off meeting (month 1)

D4.2 Design and initial documentation of the website (month 1)

D4.3 Completed and operational website (month 2)

D4.4 Overall report on the 1st scientific conference including the activities of the foreign experts, the outcome and results of the conference and the documentation of the SB meeting (month 14)

D4.5 Overall report on the 2nd scientific conference including the activities of the foreign experts, the outcome and results of the conference and the documentation of the SB meeting (month 25)

D4.6 Reports on the participation on events/conferences (depends on the exact date of the events)

D4.7 Announcement of the upcoming events and publication of their results in the mass media (TV, journals, internet) (depends on the exact date)

D4.8 Production of bulletins, leaflets and CD-ROMs:

- General, introductory material (month 1)
- Material for the two scientific conferences (months 14, 25)
- Summarizing material for the overall project results (month 36)

D4.9 Report on the final meeting (month 36)

Work package number	5	Start date or starting event:	4
Work package title	Database development		
Activity Type	SUPP		
Participant number	1		
Participant short name	ILTR		
Person-months per participant:	12		

Objectives

The objective of WP5 is to create a database to summarize the methodologies for a scientifically sound agricultural production, the results of the project and the all the relevant information that is important for every stakeholder. The aim is to create an easily accessible, user friendly surface for the database which will serve as the basis of the research supporting the planned technical advice services and TAC in the future.

Description of work

The long term objective of the project is to improve the capacities of ILTR to such a level to make it able to carry out technical advice services for agricultural producers and other stakeholders. Therefore, the main reason of creating a database is to stimulate the establishment of the regional and international links in agricultural regional development and GIS and to enhance greater active involvement of the North Great Plain Region as well as ILTR in ERA.

The database would collect data from many sources e.g. questionnaires, user feedback, research results, already possessed data, etc. It will be bilingual (Hungarian and English) to ensure the sound accessibility for the networking partners and for any other international entity which is interested in this particular field of research.

The collected information of the database will also help ILTR to strengthen its potential to be able to participate in joint research FP7 projects in the future.

Deliverables

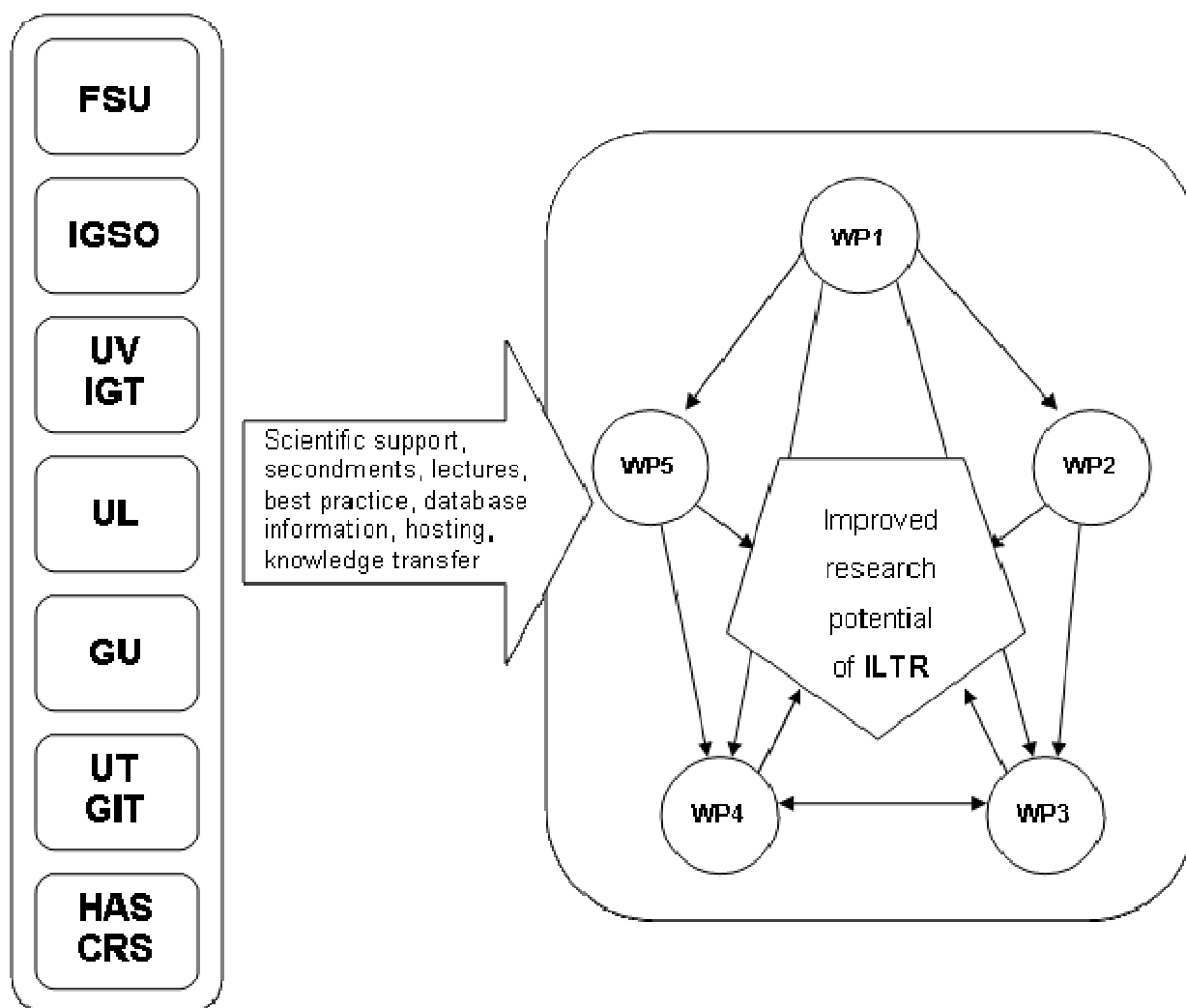
D5.1 Report on the preparatory actions (month 12)

D5.2 Completed and operational database (month 13)

D5.3 Final report on the database at the end of the project (month 36)

Table 1.2e: Summary of staff effort

Participant no./short name	WP1	WP2	WP3	WP4	WP5	Total person months
1. ILTR	22	9	115	17	12	175

**Figure 2.: Graphical presentation of the project components and their interdependencies**

Significant risks and contingency plan

In the course of the implementation of the proposed project various unexpected events might occur which hinder the sound progress of the project. The management must be prepared for everything that has the slightest chance to change the planned schedule.

WP1 – Project management

Economic crisis:

It is an undeniable fact that there is an economic world crisis, which is likely to affect our lives for another couple of years including the 36 months of the planned implementation as well. Therefore, the EUR/HUF exchange rate might go into extremes; it is around 300 HUF right now, although it was around 250 HUF in the recent years. Naturally, these external effects have the most significant influence on our proposed budget. Therefore, we composed our budget expecting a little more rise in the EUR/HUF exchange rate.

Composition of the management changes due to unexpected events:

The composition of the management is solid. However, anything might occur that changes the members of management during the 36 months. Fortunately, ILTR has additional experts, who could be backup members of the management in such a case.

WP2 - Infrastructural development

Delays in the shipment of the purchased equipment:

We prepare in advance to postpone the related activities, in order to adapt to the changes and not to have greater delays in the implementation.

Purchase price of the equipment rises compared to the planned budget:

In the course of the public procurement procedure ILTR will choose the most economic solution to comply with the proposed budget.

WP3 Improvement of the human resources

The expert(s) to be hired by ILTR cannot take the job due to unforeseen events.

We certainly cannot prevent or avoid this, but if it happens ILTR will make sure to find a backup expert who has the same level of knowledge and expertise like the currently chosen ones.

Problems with the timing of the scientific visits (due to illness, or any other unexpected reason):

Scientific visits need to be handled flexibly, in order to adapt to such situations. The flexible nature of the visits means that their exact date has to be able to be altered in time.

Length of secondments

The proposed length of secondments may also change due to different commitment of the seconded staff of any institution. We plan either to substitute the given expert or to reschedule his secondment period in such cases. As written above, these activities must be flexible.

WP4 Dissemination and communication

The popularity of the website is low:

As an important agricultural institution UD CASE has a very good relationship with the stakeholders and target groups of the project. Therefore, the link of the website will be placed to relevant, well visited websites.

Participation in the scientific conferences is lower than expected:

ILTR will advertise the conferences through various communication channels (website, written invitation, scientific journal, etc.)

2. Implementation

2.1 Management structure and procedures

The structure of project management activities (WP1) consists of the Project Co-ordinator (PC), the WP leaders (experts responsible for the implementation of given WPs), Communication Co-ordinator (CC), an Advisory Board (AC) and a Steering Board (SB).

Strategic decisions are made by PC and the WP Leaders after consulting with the AB and/or the SB. The CC carries out the communication with the networking partners and the public.

The SB is necessary to ensure the long-term sustainability of the project.

European Commission		
Project Coordinator, WP1 Leader (ILTR): Prof. Dr. János Nagy	Advisory Board (AC):	Steering Board (SB):
WP Leaders (ILTR staff): WP2: Dr. Attila Dobos WP3: Dr. Endre Harsányi WP4: Dr. Endre Harsányi WP5: Dr. Tamás Rátonyi	Prof. Dr. János Nagy Prof. Dr. lic. Xavier Gellynck Dr. Andrew Fieldsend Prof. Dr. Wolfgang-Albert Flügel Dr. Gerard McElwee Prof. Dr. Andrew U. Frank Professor Jerzy Banski Prof. Dr. Volker Hochschild Prof. Dr. Gyula Horváth	Dr. Norbert Grasselli Dr. László Stündl Prof. Dr. József Popp Dr. Pál Hajas Prof. Dr. Antal Stark Prof. Dr. Béla Baranyi
Communication Co-ordinator (CC): Péter Fejér		

Project Co-ordinator (PC), WP1 Leader:

Prof .Dr. János Nagy, University Professor, Head of Centre, DSc

Former rector of the University of Debrecen. Head of the Centre of Agricultural Sciences and Engineering (UD CASE), head of ILTR, university professor, DSc. Founder and leader of the unique cultivation field experiments.

His field of research: farming, cultivation. His activity in organising agricultural sciences is determinant in the Trans-Tisza region. He has been being the leader of the Land Use and Regional Development Research Group of MTA-DE. The cooperation of the research group and the Hungarian Academy of Sciences' Regional Research Centre and its Debrecen branch is of great significance. As a result of their common research, they became the centre of regional development of the North Great Plain region.

Co-ordinator, leader of numerous national and international projects. Between 2002 and 2005 he was the leader of 'Corn Consortium' implemented within the scope of National Research and Development Programme. The project co-ordinated the national corn-genetics and agro-technological research activities and the scientific dissemination of their results.

The nationally highlighted R&D project he led called „Development of production technologies with reduced number of turns in order to improve our competitiveness in the EU” based on cost saving methods and environmental aspects was closed successfully. The British-Hungarian „Long-term field experimental and large-scale field dataset” project was also closed with success.

He is the project leader of the National Technology Programme project 'Improvement of quality production and yield regularity by means of modern water management and irrigation' between 2009 and 2012.

Education, education development activity: He established an effective co-operation with HAS Research Institute for Soil Science and Agricultural Chemistry, the Rothamsted Research Institute, and the Universities of Reading, Ghent, and Wageningen. He shared his experiences with numerous foreign professors.

One of his major tasks is the supervision of 'Kerpely Kálmán' Cultivation and Horticulture Doctoral School, and the educational and consultation work carried out in it.

Publication activity: He has 336 publications to date, 113 of which are written in English.

Most important international awards:

The University of Arad (2002) and the University of Oradea (2005) have been declared him a 'honoris causa' doctor.

He has been awarded with a Socrates-award by the European Business Society for the high proportion of practical use of research results.

WP leaders:**Dr. Attila Dobos (WP2)**

Has a PhD degree, which he acquired in 2003 on the field of cultivation and horticulture. His field of research: Precision nutriment management and irrigation. His scientific research activities and results contribute to the development of precision cultivation technologies and the establishment of an optimal land use and sowing structure.

Between 2004 and 2006 he was the leader of the GVOP 3.1.1.-2004-0184/3.0 project 'Agricultural Geo-information Technical Advisory System'. The system provides support to the efficient technical advices in nutriment management.

In 2007-2008 the agriculture analyzing documentation of the Country Planning Scheme of Hajdú-Bihar County has been elaborated under his co-ordination.

He is the operative co-ordinator of the National Technology Programme project 'Improvement of quality production and yield regularity by means of modern water management and irrigation' between 2009 and 2012.

Dr. Endre Harsányi (WP3, WP4)

PhD., Head of the sub-centre of ILTR (Regional Knowledge Centre), assistant researcher at ILTR. Expert of correlation of land use, regional development and regional monitoring. Possesses preparation and management skills of various EU and national projects (e.g. HEFOP 3.3.1., HEFOP 3.3.2 projects). He was the project co-ordinator of 'Baross Gábor 2007 National Research and Development Programme' projects and Phare and Phare-CBC projects. Beside the research experience, he has educational experience as well. He is an instructor at the course 'Real Estate Management', he lectures the following subjects: real estate management, regional subsidies in the EU, regional development and policy, land use and regional development, bio-ethanol production. He also carries out the task of supervising the scientific work of PhD students. His field of research is revealing and utilizing the development possibilities by means of the analysis of the agricultural conditions, land use and regional development concept of the North Great Plain Region. Project manager of the Hungary-Romania Cross-Border Co-operation 2007-2013 project 'Development of competence based-adult education e-learning programme launch of a training for stimulating SMEs' – the implementation of which he launched in February 2010.

Dr. Tamás Rátonyi (WP5)

Associate Professor, PhD. He works at ILTR and also used to work at its precursor, the Faculty of Land Use since 1997. Expert of land use. Has a significant experience in project co-ordination and management.

Member of the following: Society of Hungarian Land Users, International Soil Tillage Organisation, Hungarian Academy of Sciences – Department of Agricultural Sciences, Cultivation Committee

He has 16 years of experience on the fields of research and education. He is the lecturer of subjects Cultivation, Agricultural land use, Plough-land soil use, Nutriment management and Fertilizing methods. His field of research covers the analysis of correlation between precision soil use and soil condition, the evaluation and development of soil preserving cultivation technologies and the development of corn based bio-ethanol production. In the course of his work he puts significant emphasis on the analysis of soil-plant interaction, preservation and improvement of soil productivity, prevention of soil deterioration and the establishment and updating of databases on this field. He is a leader or participant of various national and international projects (PHARE-CBC, OMFB, OTKA, HEFOP, Baross Gábor innovation projects)

Communication Co-ordinator (CC): Péter Fejér

Graduated from UD CASE as an economic agricultural engineer and technical translator in English. He participated in preparing project proposal documentations of international (INTERREG IVC, IVB, Hungary-Romania Cross-Border Co-operation Programme) and national calls (North Great Plain Operational Programme 4.1.1F and 2.1.1). He used to be a deputy member of the Monitoring Committee of Hungary-Romania Cross-Border Co-operation Programme. He was the contact person for the partners prior to the submission of this proposal.

Advisory Board (AB)

The Advisory Board consists of the project co-ordinator and WP1 leader Prof. Dr. János Nagy, and Dr. Andrew Fieldsend from the side of ILTR and the key experts of the partner institutions. See the relevant sections of the proposal for their profiles (except for the profile of Dr. Fieldsend, which is seen below).

Dr. Andrew Fieldsend

His experience in institutional development in the agricultural sector from 1987 includes setting up, developing and managing an agricultural research station in the UK and building the institutional capacity across faculties of the University of Debrecen (Hungary) to participate in international research consortia and to publish research papers in international media. This work involved setting and achieving targets, producing and managing budgets, partnership working and personnel management.

He also has considerable experience in the design, implementation and evaluation of rural development and applied plant research programmes since around 1993. I participated in the establishment of public-private sector funded research programmes in biochemistry, molecular biology and plant transformation at the IACR-Rothamsted and Long Ashton (University of Bristol) Research Stations. Later, he set up a rural business support service in the UK before transferring the good practice to Hungary. HVTK is developing a new agenda for rural/regional development in Eastern Hungary whilst the **EU Framework 7 project RuralJobs**, which he wrote and is managing, will recommend to the EU new strategies for stimulating rural employment. As well as regularly reviewing scientific papers prior to publication, he is an evaluator for the International Visegrad Fund. This work is supported by teaching and publishing experience and extensive IT training.

Steering Board (SB)

The task of Steering Board is to ensure the long-term sustainability of the project by helping create a long term strategy of the project and exploit the complementarity of the possible EU funds. The composition of the SB is much diversified concerning the expertise of its members. The SB will have regular meetings in order to carry out its task as effective as possible. The members of the SB are the following:

Dr. Norbert Grasselli

From the year 2005 he is deputy director at the North Great Plain (Észak-Alföld) Regional Development Agency, responsible for spatial planning, regional innovation, project pipeline, and micro-regional network coordination. He coordinated the development of the Regional Operational Program 2007-13 in Észak-Alföld. As representative of the Észak-Alföld region, he participated in tasks of the Lisbon Monitoring Platform since 2006, from the very beginning.

He works as an expert in several FP6, FP7 and INTERREG projects. INNOVA Észak-Alföld coordinates the COGNAC project, which deals with benchmarking research and innovation policies in Central- and Eastern European countries. Dr. Grasselli works as member of the Management Group in the INTERREG IIIC Regional Framework Operation project PERSPECTIVE 2007-13. Norbert Grasselli was engaged in the mid-term review of the Hungarian National Development Plan 2004-06 and participated in the peer review organized by the Assembly of European Regions at Romania's accession process.

Dr. László Stündl

Graduated from Debrecen Agriculture University, Faculty of Agronomy, holding an MSc. equivalent degree in Agriculture (Aquaculture and fisheries). He is also a certified agricultural technical translator (English-Hungarian).

His 12 years working experiences cover a wide range: project development, implementation and monitoring in agriculture, aquaculture and fisheries, aquatic resources management; research, extension and advisory activities/project development in regional/rural development; elaboration and implementation of EC/Phare/Tempus education projects: Aquaculture and fisheries, Environmental Management and Policy, Environmental Impact Assessment, Regional/rural Development, Higher Education Postgraduate programmes. Design, appraisal and detailed planning of Phare funded regional/rural development projects (SOP'97) Phare HU9705. Project co-ordination and elaboration of strategic programmes - agricultural restructuring and rural development programmes in 2 micro-regions (SAPARD). Research programme development and implementation in international context (5th RTD Framework programme, Interreg III B and IIIC).

He is Member of the Strategic and Coordination Committee of Debrecen University tasks: coordination of investment, development and RTD projects of the Centre for Agriculture and Engineering

Prof. Dr. József Popp

He is the deputy director-general of the Agricultural Economics Research Institute since 1999. He used to be a major administrative advisor at the Ministry of Foreign Affairs, where his responsibility was related to the EU accession negotiations of Hungary. Between 1990 and 1998 he was an agricultural attaché in the USA. Used to be a member of the Programme Council of National Research and Development Programmes (2000-2005)

Member of the task force at RISE (Rural Investment Support for Europe) Foundation.

Member of the European Association of Agricultural Economists (EAAE).

Member of the editorial board of the following journals:

- Studies in Agricultural Economics, AKI (president)
- Applied Studies in Agribusiness and commerce (Apstract-T)

Member of the Agricultural Economy Committee of the Hungarian Academy of Science (HAS) (2004-)

Member of the Reviewer Committee of the National Office for Research and Technology (2008-)

Dr. Pál Hajas

Agricultural and Rural Development Specialist, with over 30 years active experience in agriculture, livestock production systems, communication (agricultural journalism, printed and electronic), governance, rural development and LEADER formation and coordination of LAG in particular. Strong experience in preparation of regional RD strategy, networking among institutions and individual experts, organize large meetings in multicultural environment, events, shows and other professional seminars. Experience in RD adult training under EU, the World Bank and IFAD funding. Prepare and implement territorial development programs. Twenty years continuous international experience in Asia, Africa, Europe and the Near East with FAO of the UN and six years experience in EU type RD and rural tourism in particular. Beside RD activities, he is the founder of the Agroservice Group, a farming and area development enterprise in North Hungary, including oilseed, grain and fruit growing, indigenous pig breeding, rural tourism and hospitality services. Experience in forming, promoting and managing rural NGOs and CSOs focusing village rehabilitation, ecological tourism, wildlife management and biodiversity. Since 2003, active member of various EU Leonardo transnational projects in rural tourism, setting up tourism learning areas, biodiversity and ecolabel training.

Prof. Dr. Antal Stark

Until 1985 he worked at the University of Economics in Budapest as a lecturer, head of institute and DSc of Economic Sciences. He was vice rector for two periods. He was the state secretary and deputy state secretary at the Ministry of Education and Culture between 1985 and 2006. He is a scientific advisor of the Ministry of Education and Culture since 2006. His fields of research: state finance and economic policy.

2.2 Individual participants

The **Friedrich Schiller University Jena (FSU)** was founded in 1558 by Duke Johann Friedrich I and is one of the most historic universities in Germany. This is reflected by its membership in the prestigious COIMBRA group, a network of traditional European universities (<http://www.coimbra-group.be/>). The Department of Geoinformatics, Hydrology and Modelling (DGHM: www.geoinf.uni-jena.de) was established in October 1994 and is headed by Prof. Dr. W.-A. Flügel. It has an outstanding record of successfully conducted and coordinated national and European RTD projects focussing on integrated river basin systems analysis, process hydrology and regional basin modelling, ILWRM and information system design.

The multidisciplinary research team comprises scientists from relevant scientific disciplines, e.g. computer science, geography, hydrology, data management and software engineering. By means of open source software (OSS) components they jointly developed the *Jena Adaptable Modelling System (JAMS)* as a Modelling Framework System (MFS) and the *Adaptable Integrated Data and Information System (AIDIS)* as an Environmental Spatial Decision and Information Support Tools (ESDIST) to manage, analyse, and model spatial data as well as time series and metadata via the internet.

Their professional and research expertise is internationally well recognised and the DGHM is cooperating with leading research institutions in Africa, Asia, Australia, Europe, and the US. Cooperative research projects carried out by the DGHM in this regard received national and European funding and comprise (i) process analysis of complex geo-systems, (ii) management and modelling of spatial distributed heterogeneous geo-information, (iii) regional modelling of distributed water and solute transport, and (iv) Integrated Land and Water Resources Management (ILWRM).

The DGHM has solid expertise in coordinating and cooperating in integrated EC funded projects within the 4th till 7th FP of the EC (ARSGISIP ENV4 – CT97 - 0396; IWRMS ERBCIC 18CT 970144; IRON CURTAIN: QLRT-CT-2001-01401; TISZA: EVK1-CT-2001-00099, INWAMA CN/ASIA-LINK/003 (81269); BRAHMATWINN GOCE-036952, Twin2Go: 226571).

Prof. Dr. Wolfgang-Albert Flügel, MSc (Univ. Freiburg) and PhD (Univ. Heidelberg) in Geography/Hydrology, is head of the department for Geoinformatics, Hydrology and Modelling (DGHM) since 1994. He is an international recognized scientist on the field of Geoinformatics and Hydrology with numerous contacts to national and international research teams and institutions. From 1985 till 1990 Prof. Flügel was working as Senior Specialist Scientist at the Hydrological Research Institute (HRI) in South Africa and from 2002 till 2003 as Principal Hydrologist at the International Water Management Institute (IWMI) in Colombo, Sri Lanka. His main interests are process hydrology and hydrological systems analyses, regionalisation and GIS, landscape system analysis, hydrological basin modelling and the development of integrated geo-relational database management systems.

Dr. Peter Krause, MSc and PhD in Hydrology (Univ. Freiburg). He has developed the internationally recognized J2000 Model suite applied also by the USGS and has been involved with different aspects of hydrological research and integrated water resources management (IWRM) since more than 15 years in Germany, Africa and Asia. His research concentrates on regionalization approaches and model application for IWRM with focus on irrigation agriculture. In several national and international projects he enhanced the RU delineation approach in order to regionalize hydrologic processes and allocate these processes to landscape units (HRU). He contributed to the standardization of the rule based GIS delineation approach.

Dr. Sven Kralisch, MSc in computer science and PhD in Geoinformatics (FSU-Jena) is team leader of the multidisciplinary JAMS developing research team that comprises scientists from computer science, geography, hydrology, data management and software engineering. Their input to the project is the JAMS Modelling Framework System (MFS) designed to manage, analyse, and model spatial data as well as time series and metadata via the internet and system development to support decision making processes.

Dr. Manfred Fink, MSc (Univ. Kiel) and PhD (FSU-Jena) in Geography/Hydrology has about 10 years of professional expertise in process hydrology, development of water and solute transport models and landscape system analysis. He has been involved in various research projects

focusing on hydrological process analysis and environmental modelling. His research is focusing on IWRM, water and solute modelling, interflow process dynamics and GIS.

EC-projects:

1. Integrated Water Resources Management System (Co-ordination): ERBCIC 18CT 970144
2. Applied Remote Sensing and GIS Integration for model Parameterization (Co-ordination): ARSGISIP ENV4 – CT97 – 0396
3. Decision support for sustainable rural development in areas along the former Iron Curtain (Partner): IRON CURTAIN QLRT-CT-2001-01401
4. Tisza River Project (Partner): TISZA EVK1-CT-2001-00099
5. Integrated Water Resources Management (Co-ordinator): INWAMA CN/ASIA-LINK/003 (81269)
6. Twinning European and South Asian River basins to enhance capacity and implement adaptive integrated water resources management approaches (Co-ordinator): BRAHMATWINN GOCE-036952
7. Coordinating **T**winning partnerships **t**owards more adaptive **G**overn-ance in river basins (Partner): Twin2Go: 226571

The Institute of Geography and Spatial Organisation (IGSO) of the Polish Academy of Sciences is an independent research institute. The Institute is the main centre of scientific research in the domain of physical and socio-economic geography, as well as regional science in Poland and GIS. IGSO is the leading centres of geographical and regional studies in East-Central Europe. The Institute has a research staff of 44 and 14 PhD-students.

IGSO specializes in research concerning mechanisms of transformation, contemporary change in rural areas, interdependence of natural and socio-economic processes and phenomena in space, demographic and ethnic processes in EC Europe etc. Research of the rural areas concern the following themes: transformations of the spatial and functional structure, conditions and factors of rural development, changing of land use, social problems and prospects for the multifunctional development of rural areas.

IGSO participated in EU 5th, 6th, 7th Framework Programme, INTERREG including ESPON projects, as well as bilateral projects.

Jerzy Bański

Full professor at the Institute of Geography and Spatial Organization PAS and the Maria Skłodowska-Curie University. Graduated from the Department of Geography and Regional Studies, Warsaw University (MSc), and the Department of Scientific Photography and Image Information, Warsaw University (postgraduate studies). PhD degree and habilitation acquired at the Institute of Geography and Spatial Organization Polish Academy of Sciences (1996 and 2000). President of the Polish Geographical Society, vice-chairman of the Scientific Council of the Institute of Geography and Spatial Organisation; head of the Commission of Rural Areas Polish Geographical Society, editor of Rural Studies (periodic); member of the Steering Committee of the European Rural Development Network, vice-chair of the Commission on Local Development, International Geographical Union. His research fields include spatial and regional policy, rural development, rural geography, land use, problem and success areas.

Co-ordinator and member of various projects author of numerous relevant publications (see list below).

Dariusz Świątek

Research assistant at the Institute of Geography and Spatial Organization. Graduated from the Catholic University of Lublin, Faculty of Social Sciences, Institute of Sociology, and the Faculty of Architecture, Warsaw University of Technology. His research fields include changes of rural function on suburban and rural areas, development of small and medium size entrepreneurship on local and regional level and the use and adaptation of technical infrastructure and information/communication technologies on local level. Member of the following projects: Social Exclusions, Household Economic Practices, eBusiness W@tch, TRANSFORM – Transformation of Regional Societies Through ICT. Expert of social sciences research and analysis methods

Marcin Mazur

Research assistant at the Institute of Geography and Spatial Organization, PAS. Graduated from the Institute of Earth Sciences, Maria Curie-Skłodowska University in Lublin, MSc and the Faculty of Applied Mathematics, University of Science and Technology, Cracow. His research fields include rural geography, changes in a city fringe, rural-urban continuum, thematic cartography, statistic maps methods. Member of the research teams of various projects (2007–2010, Agricultural Atlas of Poland; 2006–2008, Rural success areas – conception, identification, diagnose; 2007–2009, Project Framework Program 6 – Foresight Analysis for Rural Areas of EU (FARO) (ALTERA Wageningen); Types of interaction between Environment, Rural Economy, Society and Agriculture in European regions (TERESA)).

Most relevant publications:

- Węclawowicz G., Degórski M., Komornicki T., Bański J., Śleszyński P., Więckowski M., 2009, *Study of Spatial Developments In the Polish-German Order Region* [in:]. W. Strubelt (ed.) *German Annual of Spatial Research and Policy 2008. Guiding Principles for Spatial Development In Germany*, Springer, 153-184.
- Bański J., 2009, *Kern- und Peripheriegebiete und die Raumentwicklung: Beispiel Polen*, [in:] T. Weith, H.J. Kujath, A. Rauschenbach (eds.), *Alles Metropole? Berlin-*

Brandenburg zwischen Hauptstadt, Hinterland und Europa, Reihe Planungsrundschau, 17, Berlin, 71-86.

- Bański J., 2009, *Dilemmas for regional development in the concepts seeking to develop Poland's spatial structure*, Regional Studies, Routledge..
- Bański J., 2008, *Agriculture of Central Europe in the period of economic transformation*, [in:] J. Bański, M. Bednarek M. (eds.), *Contemporary changes of agriculture in East-Central Europe*, Rural Studies (Studia Obszarów Wiejskich), 15, IGiPZ PAN, PTG, Warszawa, 9-22.
- Bański J., 2007, *The development of rural areas in Central Europe – an identification of new processes*, [in:] A.D. Kovacs (ed.), *Regionality and/or Locality*, Discussion Papers, Centre for Regional Studies of Hungarian Academy of Sciences, Pecs, 29-37
- Bański J., 2006, *The development of rural areas* [in:], M. Degórski (ed.) *Natural and human environment of Poland. A geographical overview*, Polish Academy of Sciences, Polish Geographical Society, 193-210, Warsaw
- Bański J., 2005, *The development of new housing constructions in suburban areas*, [in:] *Geography in Europe of Regions*, 6th Moravian Geographical Conference, CONGEO'05, Institute of Geonics, Academy of Sciences of the Czech Republic, 5-14.
- Bański J., 2005, *Suburban and peripheral rural areas in Poland – the balance of development in the transformation period*, *Geograficky casopis*, 57, 2, Slovak Academic Press, Bratislava, 117-130.

Most relevant projects:

Co-ordinated by Jerzy Banski:

- 2009-2010, *Perspectives for agriculture of Vojvodina in the light of scenarios and models elaborated in the framework of the research projects of the European Union*, Centre for Strategic Economic Studies, Vojvodina
- 2008-2011, *European Development Opportunities In Rural Areas (EDORA)*, ESPON
- 2005-2008, *Administrative Technologies and the Governance of Agrarian Reform: Liberal Modernization of the Polish Cadastral Infrastructure*, supervisor Francis Harvey (University of Minnesota)
- 2007-2009, Project Framework Program 6 – *Foresight Analysis for Rural Areas of EU (FARO)*, coordinator M. Perez-Soba, ALTERA Wageningen
- 2007-2009, Project Framework Program 6 – *Types of interaction between Environment, Rural Economy, Society and Agriculture in European regions (TERESA)*, coordinator E. Dallhammer, Austrian Institute for Regional Studies and Spatial Planning

Co-ordinated by others:

- ESPON 1.1.1 "Review and evaluation. Implications for Poland. An expert assessment elaborated for Ministry of Economy, 2004
- ESPON 1.1.3. project „Option for spatially balanced Developments in the Enlargement of the EU”, The Royal Institute of Technology (KTH) in Stockholm, 2003-2005
- ESPON 1.3.3 The role and spatial effect of cultural heritage and identity, 2004-2006
- ESPON 1.4.1 "The role of small and medium sized towns"
- ESPON 2.3.1 „Application and effects of the ESDP in member states", 2004-2006
- ESPON 2.3.2 "Governance of territorial and urban policies from EU to local level". 2004-2006
- ESPON 1.4.3 Study on Urban Functions, 2006-2007
- Integrated Assessment of Spatial Economic and Network Effects of Transport Investment and Policies" (IASON). 5th Framework Programme of EU, 2002-2004
- PLUREL – "Peri-urban land use relationships – strategies and sustainability assessment tools for urban-rural linkages", 2007-2010
- Transatlantic thematic Network on Sustainable transport in Europe and links and liaisons with America (STELLA). 2002-2004. 5th Framework Programme of EU

Institute of Geoinformation of Technical University Vienna (UV)

TU Wien, Institute for Geoinformation (<http://www.geoinfo.tuwien.ac.at>) is an academic research and education institution. Group leader is Andrew U. Frank. Strength of the institute is on economical aspects of Geoinformation, its use and usability, and formal modeling aspects of services. The institute is an engineering group (in particular Surveying Engineering and Geodesy), concerned with the collection and use of spatial information, and working now for years in interdisciplinary teams. The department has participated in a number of European projects. The group in Vienna is closely integrated in the GIS research and development field, and has widespread contacts with industry, in particular with GIS software developers in Europe and the USA.

Prof. Dr. Andrew U. Frank is a Professor of Geoinformation at the Technical University of Vienna since 1991, where he teaches courses in spatial information systems, representation of geometric data, design of Geographic Information Systems for administration and business, selection of GIS software, and economic and administrative strategies for the introduction of GIS. He is head of the Institute for Geoinformation and Land Surveying since its foundation in 1999.

He leads an active research group focusing on problems of spatial cognition, user interfaces for GIS, and the economic and organizational aspects of collection, management and use of geographic information. His present research interests comprise the cultural differences among European GIS-users as well as administrative and legal topics. He was also leader of the project "Study on European GI Policy Issues" under the GI2000 program of the European Commission. Most recently, he concluded an economic study advising the Austrian Government on geographic infrastructure policy.

Since 1980 Dr. Frank has published widely on database management systems for GIS, in particular on spatial access methods and spatial query languages. In 1992 he organized the first "International Conference on Spatial Theory". Since 1993 this COSIT-Conference has been held every two years alternately in Europe or in the USA. Then also the book "Life and Motion of Socio-economic Units" was published, which he edited (with Jonathan Raper and Jean-Paul Cheylan).

He is currently Editor-in-Chief of GeoInformatica, co-editor of International Journal of Applied Earth Observations and Geoinformation, and on the editorial board of Geographical Systems, International Journal of Geographical Information Science, Revue internationale de géomatique, Journal of Spatial Cognition and Computation, Geodetski Vestnik (Journal of the Association of the Surveyors of Slovenia) and of the Annals of the Association of American Geographers. He is also a Corresponding Member of the German Geodetic Commission.

Prior to his current position, Dr. Frank has been a professor of Land Information Studies in the Department of Surveying Engineering at the University of Maine. He was also co-founder and later head of the Maine branch of the National Center for Geographic Information and Analysis (NCGIA), a research center funded by the National Science Foundation.

Gerhard Navratil is a research at the Institute of Geoinformation and Cartography at the Vienna University of Technology. In 2007 he received the 'venia docendi' (right to teach) from the Vienna University of Technology in the field of Geoinformation. He has more than 10 years of experience in teaching, publication, and project work. His main research activities are in land management and GIS, especially processes, data quality aspects, and the legal perspective.

Dr. Navratil is in the scientific committee for a number of conferences and workshops including COSIT, the International Conference on Urban Planning and Regional Development in the Information Society (CORP), and the Workshop on Behaviour Monitoring and Interpretation.

Selected publications:

Frank, A. U. (2001). "Tiers of ontology and consistency constraints in geographic information systems". *IJGIS* **15**(7): 667-678.

Frank, A. U. (2000). "Geographic Information Science: New methods and technology." *Journal of Geographical Systems, Special Issue: Spatial Analysis and GIS* **2**(1): 99-105.

- Frank, A. U. (1999). "One step up the abstraction ladder: Combining algebras – From functional pieces to a whole". In *Spatial Information Theory – A Theoretical Basis for GIS (Int. Conference COSIT'99)*. Berlin, Springer-Verlag.
- Frank, A. U. (1998). "Formal models for cognition - Taxonomy of spatial location description and frames of reference as an example". In *Spatial Cognition. An Interdisciplinary Approach to Representation and Processing of Spatial Knowledge*. C. Freksa, C. Habel and K. F. Wender (eds). Berlin, Springer-Verlag.
- Frank, A. U. and M. Raubal (1998). "Specifications for Interoperability: Formalizing Image Schemata for Geographic Space". *8th Int. Symposium on Spatial Data Handling, SDH'98*, Vancouver, Canada.
- Frank, A. U. (1998). "Different types of 'times' in GIS". In *Spatial and Temporal Reasoning in GIS*. M. J. Egenhofer and R. G. Golledge (eds). Oxford, Oxford University Press.
- Car, A. and A. U. Frank (1997). "Formalisierung konzeptioneller Modelle für GIS - Methode und Werkzeug." *ZfV* **122** (3): 99-114.
- Frank, A. U., G. S. Volta, et al. (1997). "Formalization of Families of Categorical Coverages." *International Journal of Geographical Information Systems* **11**(3): 215-231.
- Mark, D. and A. U. Frank (1996). "Experiential and formal models of geographic space." *Environment and Planning B* **23**: 3-24.
- Frank, A. (1996). "Qualitative spatial reasoning: cardinal directions as an example." *International Journal of Geographical Information Systems* **10** (2): 269-290.
- Burrough, P. A. and A. U. Frank (1995). "Concepts and paradigms in spatial information: are current geographic information systems truly generic?" *International Journal of Geographical Information Systems* **9** (2): 101-116.

Most relevant projects:

- ReviGIS, Uncertainty Knowledge Maintenance and Revision in Geographic Information Systems: involved persons: Gerhard Navratil, Marianne Jahn duration: until April 2004
- Panel-GI, Pan European Link for Geographical Information: involved persons: Andrew Frank, Martin Raubal, and Maurits van der Vlugt
- COMMUTER, involved persons: Andrew U. Frank, Martin Raubal, Maurits van der Vlugt duration: until July 1999
- 10th EC-GI: Open Source Solutions for a European Web Portal, GEORAMA
- EUROCOV: European Web Coverage Services Project Proposal; 6. Okt. 2009;
- COST Aktion IC0903 MOVE Knowledge Discovery from Moving Objects
- COST Aktion TU 0801 Semantic Enrichment of 3D City Models for sustainable urban Development"

University of Lincoln (UL)

The University of Lincoln, was the first new city-centre university campus to be built in the UK in 25 years. Since then, more than £75 million has been invested in this campus leading the Times Student Guide to comment that it was 'the most dramatic transformation of a university in recent times'.

Lincoln is committed to developing strong and sustainable research of relevance to the local, national and international community. As evidence of this, more than two thirds of the University's research submitted to the UK government's 2008 Research Assessment Exercise – a nationwide audit of research quality – was recognised as having world-leading elements, the highest ranking possible in the RAE. Subject areas which were particularly successful included: Business and Management Studies, Communication, Cultural and Media Studies, Computer Science and Informatics, Education, History, Psychology, and Social Work & Social Policy.

This strong performance has been recognised by the Higher Education Funding Council for England, which has earmarked £1.9M per annum for Lincoln, up 628% from previous years.

In other measures of success, the University has been ranked 37th out of 101 universities in the Times Higher Education's recent annual Student Experience Survey. And in last year's National Student Survey, the University's overall satisfaction score increased to 4.1 out of 5.

In the academic year 2007/08, the University had 9695 students of which over 700 were postgraduates. The university accepts 97% of its full-time undergraduates from state schools or colleges; 18% of undergraduates come to the university from neighbourhoods with traditionally low levels of participation in higher education. There are 496 members of academic staff engaged in research, scholarship and teaching across the University.

The Faculty of Agriculture, Food and Animal Sciences is the University's specialist faculty for Agriculture, Land-based and Food Manufacturing sectors operating from two campuses, Riseholme Park our 415ha historic estate which home to Land-based and Biological Sciences and Holbeach, the National Centre for Food Manufacturing. Research staff have expertise is GIS and Land use

Dr Gerard McElwee is an expert in Land Use, Farm Diversification and Rural Development and is Reader in Rural Enterprise, has published extensively in the area of Farm Enterprise and Diversification. He was a partner in the EU-ESoF Framework 6 'Developing the entrepreneurial skills of farmers' SSPE-CT-2005-006500, 5 European University partners. He is Editor of International Journal of Entrepreneurship and Innovation.

His most recent relevant publications are:

Relevant chapters:

- McElwee, G. (2008) 'The cross European dimension' in 'Understanding Entrepreneurial skills in the farm context' SSPE-CT-2005-006500 6th Framework ISBN: 978-3-03736-020-0 pp 55-66
- McElwee, G. (2008) 'The Entrepreneurial farmer in England' 'Understanding Entrepreneurial skills in the farm context' SSPE-CT-2005-006500 6th Framework ISBN: 978-3-03736-020-0 pp 67-105

Relevant journal articles:

- McElwee, G., and Hosseini, S. (2010) 'Improving the entrepreneurial potential of rural Women entrepreneurs in Northern Iran' **International Journal of Entrepreneurship and Small Business** 11(2) (forthcoming)
- McElwee, G., and Annibal, I. (2010) 'Business Support for Farmers: the Farm Cornwall Project' **Journal of Small Business and Enterprise Development** (forthcoming)
- McElwee, G. (2008) 'The Rural Entrepreneur: Problems of Definition' **International Journal of Entrepreneurship and Small Business** 6(3) pp 320-321
- McElwee, G. (2008) 'A Taxonomy of Entrepreneurial Farmers' **International Journal of Entrepreneurship and Small Business** 6(3) pp 465-478
- de Wolf, P., McElwee, G., and Schoorlemmer, H. (2007) 'The European farm entrepreneur? A comparative perspective' **International Journal of Entrepreneurship and Small Business** 4(6) pp 679-692

Relevant projects of UL:

2002	FP5	IST-2001-38763	DG Research	LEGE-WG (Learning Grid of Excellence)
2003	Socrates Minerva	90521-CP-1-2001-1-UK-Minerva-M	EACEA	HELENE (Higher Education Learning Network Environment for Europe)
2003	FP5	IPS-2001-41082	DG Research	ATHENA
2004	Mobility	CLT2004/A1/Gr-2091	DG Education and Culture	EC-PHAROS
2004	FP6	IST 004337	DG Research	CALIBRE (Co-ordinating Action for Libre Software Engineering for Open Development Platforms for Software & Services)
2005	Social Protection and Social Integration	VS/2005/0374	DG Employment, Social Affairs and Equal Opportunities	Integrating Children's Perspectives in Policy Making to Combat Poverty and Social Exclusion Experienced by Single Parent Families
2005	FP6 - STREP	SSPE-CT-2005-006500	DG Research	EsoF (Entrepreneurial Skills of Farmers)
2006	FP6	IST 027654	DG Research	PASION (Psychological Augmented Social Interaction over Networks)
2008	LLP - Leonardo	135182-2007-IT-KA3-KA3MP	EACEA	DREAD-ED (Disaster Readiness through Education)
2009	ESF	EW08-198	ESF	European Feminism's Engagement with its own past
2009	TEMPUS	ETF-JP-00536-2008 145544-TEMPUS-1-2008	DG EAC	MOSWET (Modernising Russian Social Work Education and Training)

Ghent University (GU) - www.ugent.be - <http://www.agecon.ugent.be/>

Ghent University offers high-quality, research-based education in all academic disciplines. Greater than € 175 million is invested in research projects on behalf of public and private partners. Today Ghent University attracts over 28,000 students and 6500 staff members, of which 912 professors. The Faculty of Bio-engineering is concerned with research on the production and processing of living matter, with a view to producing healthy, safe and long-term products. The Department of Agricultural Economics, and in particular the division of agro-food marketing contributes to this objective by applying socio-economic and marketing techniques to agro-food in the broadest sense: involving consumer studies, chain management, innovation and network studies, waste treatment and diversification (traditional products, food tourism). In total, the department employs 50 people: 5 professors, 30 PhD-students, 10 researchers and 5 administrative staff members.

Xavier Gellynck is professor at the Department of Agricultural Economics within the Faculty of Bio-engineering of Ghent University. Xavier Gellynck was promoted in the Applied Economic Sciences on the theme of the changing environment and competitiveness in the food industry. The research activities of Prof. Gellynck concentrate on the agri-business complex (agriculture, horticulture, fisheries, food processing and distribution), both on the domestic and foreign markets (EU, Central and Eastern Europe, South-East Asia and Africa). More specifically, the following research topics are well developed within the Agro-Marketing division: market research, agri-business competitiveness and management, policy evaluation, innovation management, chain management in the agri-business sector.

Most relevant projects:

- Food Innovation Network Europe (2006-2007, FP6): project aimed at the development of policy strategies and actions to create competitive food clusters in the EU.
- Truefood (2006-2009, FP6): optimizing the production and marketing of traditional food production in function of the needs of different stakeholders.
- Rural Innova (2005-2007, Interreg IIIC): increasing the innovative potential of rural regions through economic renewal.
- Development of a monitoring instrument for the Flemish agri-business complex (Flemish Community, 2007-2008).
- Analysis of the current and future spatial needs of Flemish agriculture and future spatial developments within Flemish agriculture (2006-2007, ALT/AMS/2005/3)

Most relevant publications:

- Gellynck, X., B. Vermeire and J. Viaene (2006) Innovation in the food sector: regional networks and internationalisation. *Journal on Chain and Network Science* 6, 21-31.
- Gellynck, X., B. Vermeire and J. Viaene (2007) Innovation in food firms: contribution of regional networks within the international business context. *Entrepreneurship & Regional Development* 19, 209-227.
- Gellynck, X., A. Molnár and L. Aramyan (2008) Supply chain performance measurement: the case of the traditional food sector in the EU. *Journal on Chain and Network science*, Vol. 8(1), 47-58.

Vandermeulen, V., Gellynck, X., Van Huylenbroeck, G., Van Orshoven, J. and Bomans, K. "Farmland for tomorrow in densely populated areas", *Land Use Policy*, Vol. In Press, Corrected Proof.

Jacques Viaene is a Professor of Agricultural Economics at the Faculty of Bioscience engineering, University of Ghent, Belgium. His research fields are: agricultural marketing, price analysis, agricultural extension and sociology, Agricultural and Food Economics, Agricultural Economics Developing Countries: Marketing. **Valerie Vandermeulen** is a Post-doctoral researcher at the Department of Agricultural Economics. She obtained her PhD in 2008 in "Multifunctional farming strategies in peri-urban and urbanized regions with focus on Flanders". **Bert Vermeire** has acquired his PhD degree at he PhD candidate at the Department of Agricultural Economics this summer. He has a master in social anthropology and a master-after-master in land use planning. His PhD research focuses on the role of networking in food innovation from a development perspective. **Adrienn Molnár** is a PhD candidate at the Department of Agricultural Economics. She has a master in agricultural economics. Her PhD research focuses on chain performance and relationships in the agri-food industry.

The Geographical Institute of Tuebingen University (UT GIT), (<http://www.geographie.uni-tuebingen.de/>) is a science and teaching department, carrying out research on process based landscape development due to natural and human impact with a major research focus on GIS and Remote Sensing as well as on the management of rural areas. This focus is realized through problem oriented approaches in spatial modelling, DBMS as well as applied training in these subjects. Methodological research based on parameter estimation necessary for rural area assessment (economic growth – sealed areas, conditions of agricultural crops – potential for regenerative energy, forests – management of open grassland areas, biodiversity, water quality, soil erosion, etc.) has been carried out in the past. In the division of Economic Geography specialists bring in expertise concerning the management of rural areas with experience in indicator calculation, selection and interpretation.

Previous experience related to these activities

GIT has substantial experience in the field of innovative approaches in spatial modelling as well as multi-sensoral remote sensing, which is documented through several successful previous national and international GIS and Geoinformatics projects. Recent research objectives include the structural analysis of peripheral regions in Central Europe (EU-project IRON CURTAIN) as well as sophisticated GIS and RS based water balance modelling within the TISZA RIVER project EU. Additionally GIT is specialized in regional economic transition research in Central and Eastern Europe, rural and agricultural structural change (successfully finished interdisciplinary DFG research group “AGRARSTRUKTURELLER WANDEL”), as well as on spatial econometrics.

Key researchers involved:

Dr. Volker Hochschild (<http://www.geographie.uni-tuebingen.de/index.php?id=324>) is a professor for physical geography at the University of Tuebingen since 2004. His research focus is on GIS analysis, generation of GIS databases, and problem oriented analysis of spatial data. This is concerning the development of risk potentials and management recommendations. He has published more than 60 papers in peer-reviewed journals, initiated and participated in numerous projects (German Research Foundation: DFG, European Union: EU) most of them based on extensive international cooperation with various countries in and outside Europe (Müschen et al. 2000, Böhm and Hochschild 2003, Taddei & Hochschild 2003, Hochschild et al. 2005).

Prof. Dr. Sebastian Kinder (<http://www.geographie.uni-tuebingen.de/index.php?id=344>) is holding the chair of Economic Geography at the Eberhard Karls University Tuebingen. He graduated in Geography at Humboldt-University Berlin (HU Berlin) as well as in Regional Planning at the Berlin Institute of Technology (TU Berlin). In 2001 he finished his doctoral degree at the University of Oxford and continued to work at the Institute of HU Berlin. His research focuses on regional economic analyses in Central and Eastern European countries. Recent research included projects on structural change in the agricultural sector of Poland as well as studies on economic transformation processes in Poland and Hungary (Kinder 2007, Dannenberg & Kinder 2007, Dannenberg et al. 2008).

Dr. Jan Kropacek is a microwave remote sensing specialist at Geographical Institute of the University of Tuebingen. Until 2008 he joined the radar group in the Global Vegetation Monitoring unit of JRC (Ispra, Italy).

Dr. Michael Märker is an expert in geomorphology, GIS and database management. He is leading international projects in Chile, Italy and South Africa.

References:

- **Böhm, B. & Hochschild, V. 2003:** Remote Sensing Applications for Water Resources Management of the Tisza River Basin. - Proceedings of the 30th International Symposium on Remote Sensing of Environment, 10.-14.11.2003, Honolulu.
- **Dannenberg, P. & S. Kinder, T. Kümmerle 2008:** Farm size and land use pattern as indicators of post-socialist structural change in Poland. In The Professional Geographer 60 (4), 503-520.
- **Dannenberg, P. & S. Kinder 2007:** Cluster-Strukturen in landwirtschaftlichen Warenketten in Ostdeutschland und Polen. Hamburg.

- **Hochschild, V., Weise, C. & Selsam, P. 2005:** Die Aktualisierung der „Digitalen Grundkarte Landwirtschaft“ in Thüringen mit Hilfe von Fernerkundungsdaten. - Photogrammetrie, Fernerkundung, Geoinformation (PFG), 3: 201-208, Stuttgart.
- **Kinder, S. 2007:** Percolation in clustering processes of advanced producer services. A theoretical approach. In: The Service Industries Journal 27 (5), 635-652.
- **Kropacek, J. 2001:** Remote Sensing in Research on the Dokeske Piskovce Sandstones (in Czech), Nature of Former Military Areas Malada and Ralsko - Proceedings of Conference in Mlada Boleslav, p. 143 – 145.
- **Kropacek, J. 2004:** Detection and Enhancement of shadows in High Resolution Satellite Data (in Czech), Geografie, Volume 109, 4, 304-313.
- **Märker, M., Moretti, S. & G. Rodolfi 2001:** Assessment of water erosion processes and dynamics in semiarid regions of southern Africa (KwaZulu/Natal RSA; Swaziland) using the Erosions Response Units Concept. Geogr. Fis. Dinam. Quat., Vol. 24, 71-83.
- **Märker, M., Bongartz, K. & W.-A. Flügel 2004:** Development of a GIS-based Decision Support Tool for Integrated Water Resources Management in Southern Africa. – In: Pahl-Wostl, C., Schmidt, S. & Jakeman, T. (eds) iEMSs 2004 International Congress: "Complexity and Integrated Resources Management". International Environmental Modelling and Software Society, Osnabrueck, Germany, June 2004.
- **Märker, M., Castro Correa, C.P., Pelacani, S. & M.V. Soto Bauerle 2008:** Assessment of soil degradation susceptibility in the Chacabuco Province of Central Chile using a morphometry based response units approach. Geogr. Fis. Dinam. Quat.
- **Müschen, B., Flügel, W.A., Hochschild, V., Steinnocher, K., Quiel, F. & Xie, X. 2000:** Derivation of hydrological and solute transport model parameters by remote sensing methods in the ARSGISIP project. - Photogrammetrie, Fernerkundung, Geoinformation (PFG), Sonderheft Jena, 5: 321-332, Stuttgart.
- **Taddei, U. & Hochschild, V. 2003:** A Visualisation System for Environmental Information Systems and Geohydrological Modelling. – Buhmann/Ervin (eds.): Trends in Landscape Modelling. Proceedings at Anhalt University of Applied Sciences 2003: 10-19, Wichmann, Heidelberg.

The Centre or Regional Studies (HAS CRS) was established in 1983 as a network based research institution of the *Hungarian Academy of Sciences (HAS)* with the task of carrying out multi-disciplinary research on urban and regional issues. The new political-economic situation after 1989 and emerging aspirations for EU-membership reinforced the need to study spatial processes and Hungary's position within a reshaping Europe.

The CRS aims at satisfying this need by engaging in different types of activities. Besides carrying out academic research, staff with specialised expertise is involved in independent contract research projects commissioned by various public and private bodies. Consultancy areas include among others regional, urban and rural development, public service provision and environmental management. The Centre equally acts as a base for high quality training in urban and regional issues by encouraging staff to assume a role in different graduate, postgraduate and PhD programmes across a wide range of related disciplines. These activities are all benefiting from the Centre's strong national and international links. Finally, in order to popularise academic knowledge and disseminate research findings among professionals, the CRS initiated the setting up of the Hungarian Regional Science Association. By combining the worlds of research, practice and education, the Centre aims at effecting positive changes in Hungarian spatial policy and thus in the country's spatial structure. A further objective is to extend the Centre's reach and to realise its potential of becoming a centre of excellence in academic and applied research on spatial issues in Central and Eastern Europe.

Key personnel:

Prof. Dr. Gyula Horváth:

Director General (from May 1997) of the Centre for Regional Studies, HAS, Pécs

Main field of research: European regional policy, regional co-operation in Central Europe, and regionalism, restructuring and regional policy in Eastern and Central Europe.

Most recent research projects undertaken by him:

- Competitiveness of Hungarian regions and towns in the European economic area (funded by the National Research and Development Programmes), 2002–2005
- Regional development and policy in Hungary (funded by the OECD), 2000–2001
- Regional development and policy in the EU (funded by the Prime Minister's Office of the Hungarian Government), 1996–1998
- Reform of the Hungarian Regional Development Fund (funded by the Phare Regional Development Programme in Hungary), 1996

Memberships (selected):

- Elected member of the General Assembly of the Hungarian Academy of Sciences, 1998–2004
- Hungarian Academy of Sciences, Committee of Regional Sciences, 1993–
- Regional Science Association, European Section, 1980–

Prof. Dr. Béla Baranyi

Head of the Debrecen Department HAS Centre of Regional Studies.

Fields of research:

- Research of the regional and settlement development issues in Hungary; elaboration of regional and settlement development documents (concepts and programmes)
- Research of environmental protection in East-Hungary along the two sides of the Hungarian–Romanian and Hungarian–Ukrainian state borders
- Survey of the border situation and cross-border socio-economic connections in the Hungarian–Romanian and Hungarian–Ukrainian border regions of Northeast Hungary and in the Carpathian Euro-region
- Euroregional Organisations and New Interregional Formations on the Eastern Borders of Hungary

Memberships:

- Society for the Dissemination of Knowledge, 1972 –
- Debrecen Academic Committee of HAS - Working Committee of Regional and Urban Studies, 1993 –

Project experience of HAS CRS:

Vision Planet – Perspectives and Strategies of Spatial Development Policy in the Central European, Danubian and Adriatic Area (INTERREG II C) (1998–2000)

EXLINEA - Lines of Exclusion as Arenas of Co-operation: Reconfiguring the External Boundaries of Europe – Policies, Practices, Perceptions (2003-2006)

Realised within the EU's Fifth Framework Programme

ESPON project 3.2. - Spatial Scenarios and Orientations in Relation to the ESDP and EU Cohesion Policy (2004–2006)

ESTIA-SPOSE - *European Space Territorial Indicators and Actions for a Spatial Observatory in Southeast Europe* – INTERREG III B (2004–2006)

2.3 Consortium as a whole (only if relevant)

There is no formal consortium required for this call, but the support and the joint, co-ordinated work with the networking partners is essential. Through their experience and wide-range fields of studies ILTR will receive such a high level scientific added value which it could not achieve on its own, therefore international co-operation is justified. The networking partners declared that they intend to support us, the relevant Letters of Intent can be found at the end of this proposal.

We tried to compose a network which has all the scientific background we need. We looked for universities/research institutions which have considerable knowledge on the relevant fields and also serious EU project experience. Therefore we composed a network which includes experts in **general GIS, GIS+land use, general land use, and regional development**. We believe that our objectives can only be reached by means of the aid and consultation of such a multilateral network of partners we finally managed to form. The partner descriptions above are clear proofs of the high level of knowledge and competence which this internationally recognized institutions represent. They will provide the expected level of best practices and scientific support in order to help us achieve our goals. The table below shows a summary of the fields of expertise of our partners:

Partner name	Field of expertise
The Friedrich Schiller University Jena	GIS
The Geographical Institute of Tuebingen University	GIS
Institute of Geoinformation of Technical University Vienna	GIS
The Institute of Geography and Spatial Organisation (IGSO) of the Polish Academy of Sciences	GIS and land use
University of Lincoln	Land use
University of Ghent	Land use and regional development
Hungarian Academy of Science, Centre for Regional Studies	Regional development

It has to be noted that our partnership with the **Hungarian Academy of Science, Centre for Regional Studies (HAS CRS)** is on a different level compared to the one with the rest of the partners. This means that they do not participate in the secondments; they participate in the conferences and also dissemination and continuously aid us with knowledge regarding regional development. Their main significance however is helping us plan the future utilisation of the project results. Their network and expertise can serve us as a bridge between the project activities and results and the target groups who may later utilise our achievements as clients and/or beneficiaries of the future TAC.

2.4 Resources to be committed

Purchase of equipment

Circumstances and infrastructure of an international level research need to be established and the continuous improvement of instruments, experimental capacity (laboratory and field) need to be ensured. The purchase of many expensive instruments is necessary, which will serve not only research, but also the planned technical advice activities and TAC in the future. This set of instruments will ensure the achievement of results which will improve the national and international visibility and reputation of the lecturers and researchers of ILTR.

Innovation within the agricultural sector is hindered by the increased – and not fulfilled – demand for information and the disadvantages of geographical dispersion. The management of these problems is highly aided by the integration of modern technical achievements into farm management and the decision-making processes of rural development and regional development organisations.

As ILTR has an important role within the research activities of Central-East Europe, we intend to upgrade its infrastructural background to a level which is expectable from such a research facility. We plan such an equipment and software development which will result in a high-end set of tools for land use planning and precision cultivation within the region and ERA. Our possibilities for grants were only able to maintain the current infrastructural level of ILTR, large-scale upgrade was not possible.

The equipment we intend to purchase will improve the efficiency of data acquisition and monitoring activities in the first place. Currently, mainly high-scale databases stand at the disposal of research and technical advice services. These instruments and software will lay the foundation for the clarification of databases and for the precise assessment and monitoring of the local agricultural area.

The investment promotes and supports the application and adaptation of environment friendly and efficient cultivation technologies, the constant analysis of the agricultural environment and the prediction of unfavourable factors (drought, internal water, disease or pest damage, etc.). The system is suitable for the detailed plot-by-plot analysis of climatic conditions and the spatial-temporal analysis of cultivation technology parameters

The currently used equipment has been already described within section 1.2 of this proposal. Therefore, the following table shows the description and budget of the equipment to be purchased. The tables that show the planned overall budget and the percentile proportion of each WP within the total direct costs can be seen after that.

Instruments			
Name of item	pcs.	Total cost (€)	Comments, purpose, etc.
Field measuring instruments, devices			
Greenseeker RT220	1	37 087	Field NDVI, SAVI measuring and mapping device; 12 sensors
G 505 GS HH	1	5 826	Portable device that measures N content
TETRACAM MCA6	1	61 710	Multichannel camera, remote sensing of agricultural plots
FieldSpec 3	1	1 210	Spectrometer (calibration and monitoring of remote sensed data)
Veris MSP pH/EC system	1	30 250	Mapping of soil patches, pattern, determination of heterogeneity
GPS Pathfinder ProXRT	2	13 310	Upgrade of the already possessed GPS devices for the parallel use of measuring devices
DELTA-T AP4	1	10 769	Porometer
LICOR L-2000	1	10 043	LAI measuring device
Off-road vehicle (pick-up)	1	35 400	For field measurements, evaluation of fields, traction of devices, etc.
Laboratory			
Data- and MapServer (basic software + database management application)	1	36 300	High-efficiency auxiliary unit (continuous, 24h operation)
Workstation	10	21 500	Establishment of the technological background of R&D applications

Water- and vibration-proof rubber covered laptop	10	22 500	Technological background of the new R&D applications, field data collection
AO printer/scanner	1	5 445	Processing and printing of high resolution maps
Instruments total		291 350	

Immaterials			
Name of item	pcs.	Total cost (€)	Comments, purpose, etc.
Software			
RT Mapper	1	550	Greenseeker software
Desktop Mapper	1	4 070	Greenseeker software
ESRI ArcGIS 9.X	1	5 500	GIS software
Maplex 9.X	3	2 310	Editing software
Spatial Analyst 9.X	3	2 310	Analysis of spatial data
Geostatistical Analyst 9.X	3	2 310	Geostatistical analysis of spatial data
3D Analyst 9.X	3	2 310	3D analysis
Tracking Analyst	3	2 310	Paths, field data collection
ENVI	1	5 500	Evaluation of remote sensed data
Esri ArcIMS 9.X	1	11 550	Web software for GIS
ESRI SDE 9.X	1	11 550	Management of the connection between relation database and IMS
Imagine Proff X.X	2	9 130	Evaluation of remote sensed data
Imagine Subpixel Class.	2	4 400	Evaluation of remote sensed data
Immaterials total		63800	
TOTAL		355 150	

WP number	Activity	Cost (EUR)
1	Overall project and budget management	120 000
2	Purchase of equipment (detailed costs: see above)	355 150
	Training of the staff for the proper use of the new equipment	4 500
3	Initial visit of the foreign partner organizations	37500
	Employment of 2 researchers starting in month 2 (1400 EUR/month/expert)	98000
	Hosting the delegations of FSU, UT and UV (GIS themed secondment)	35000
	Hosting the delegations of IGSO (GIS+land use themed secondment)	15000
	Hosting the delegations of GU and UL (land use/regional development themed secondment)	19000
	Scientific visit at FSU and UT (6 experts, 6 nights, travel costs approx. 750 EUR/ person, accommodation costs 6*150 EUR/person, 72 EUR daily fee/person)	14750
	Scientific visits at the UV (6 experts, 6 nights, travel costs approx. 650 EUR/ person, accommodation costs 6*150 EUR/person, 72 EUR daily fee/person)	13750
	Scientific visits at UL (6 experts, 6 nights, travel costs approx. 650 EUR/ person, accommodation costs 6*150 EUR/person, 72 EUR daily fee/person)	13750
	Scientific visits at IGSO (6 experts, 6 nights, travel costs approx. 650 EUR/ person, accommodation costs 6*150 EUR/person, 72 EUR daily fee/person)	13750
	Scientific visits at GU (6 experts, 6 nights, travel costs approx. 650 EUR/ person, accommodation costs 6*150 EUR/person, 72 EUR daily fee/person)	13750
	Secondment of the ILTR staff at FSU and UT	15600
	Secondment of the ILTR staff at UV	15600
	Secondment of the ILTR staff at UL	29200
	Secondment of the ILTR staff at IGSO	15600
	Secondment of the ILTR staff at UG	15600
	Participation at 2 international events overseas (6 experts, 2600 EUR/ person/event)	31200
	Participation at 3 international events in Europe (6 experts, 1700 EUR/person/event)	30600
	1 month stays of 1 PhD student at every partner institution (approx. 7300 EUR/month)	33950
4	Kick-off meeting (21 incoming experts + 5 AD and SB members, 3 nights, 3*150 EUR accommodation cost/person, 4*72 EUR daily allowance/person, 650 EUR travel cost/incoming expert, organizational costs, programmes, etc.)	42500
	Website concept, design and maintenance	5000

	1st scientific conference and workshops in month 14, 3 night stay of every networking partner, AB and SB (21 incoming experts + 5 AD and SB members, 3*150 EUR accommodation cost/person, 4*72 EUR daily allowance/person, 650 EUR travel cost/incoming expert, organizational costs, programmes, catering costs for the additional guests of the conference, etc.)	55000
	2nd scientific conference and workshops in month 26, 3 night stay of every networking partner, AB and SB (21 incoming experts + 5 AD and SB members, 3*150 EUR accommodation cost/person, 4*72 EUR daily allowance/person, 650 EUR travel cost/incoming expert, organizational costs, programmes, catering costs for the additional guests of the conference, etc.)	55000
	ILTR annual bulletin concept, design and print (4000 EUR/year)	12000
	ILTR promotional material for the informational events (leaflets, CD-ROMs, etc.	6000
	Advertisement of ILTR, the upcoming events and future activities	5000
	Introduction of the project at national events (5 events/year, 2 participating experts)	4500
	Final meeting (21 incoming experts + 5 AD and SB members, 3 nights, 3*150 EUR accommodation cost/person, 4*72 EUR daily allowance/person, 650 EUR travel cost/incoming expert, organizational costs, programmes, etc.)	42500
5	Database costs (e.g. purchase cadastral, soil and land utilization technical databases)	40560
Direct costs (Personnel costs + Other direct costs)		1209310
<i>Personnel costs</i>		<i>338607</i>
<i>Other direct costs</i>		<i>870703</i>
Indirect costs		84652
Total eligible costs (Direct costs + Indirect costs)		1293962

WP number	Share of direct costs
1	9,92%
2	29,74%
3	38,17%
4	18,81%
5	3,35%

3. Impact

3.1 Expected impacts listed in the work programme

Upgrading the RTD capacities of ILTR

The Institute has to utilize the opportunities that result from its regional location, its existing intellectual capacity, the different production site endowments of its area and the social and economic environment. The institute has to become an organization which coordinates and integrates research and the utilization of research results. It has to undertake role of being the educational, research, mental and consulting centre the Trans-Tisza region and to coordinate and foster the development efforts of the surrounding countries (Romania, Slovakia, Ukraine, Serbia and Croatia). The higher the commitment is, the bigger the importance of the institution is, while also providing further opportunities of development.

The environment of the Institute, the Centre of Agricultural Sciences and Engineering of the University of Debrecen is the centre and coordinator of agricultural higher education, research and consultancy in the Trans-Tisza region, its mission is to develop the agriculture, environment and rural areas of Eastern Hungary. The Institute – in accordance with the Centre – considers it important to quickly apply the results achieved and developments implemented during research into education. The objectives and results formulated in the project greatly contribute to the quality full-time and PhD education, thereby maintaining and developing the need to human resource development.

The objectives formulated in this current project will be achieved by involving young researchers. Besides PhD students, it is important to apply full-time university students, thereby fostering practice-focused education. The direct guidance of PhD and full-time university students will be carried out by young researchers with PhD degree, therefore they can get experience in managements and coordination. The practical experience achieved during the project (developing a database, planning a geographical information system, using modern devices, adapting production technologies, building up direct contact with the institutions and farmers of the EU region) greatly help the scientific development of young researchers, as well as their long-term employment in the region.

The head of the Institute is also the head of “Kerpely Kálmán Doctoral School”.

The Doctoral School (DS) – founded in 1999 - researches the main methods and development opportunities of sustainable development by involving several areas and branches of science – cultivation, soil science, regional development, crop production, horticulture, plant protection, soil utilization, soil protection, soil improvement, agro-meteorology, information technology and agro-technical sciences. It is a highlighted task to examine soil protection – as an indispensable element of sustainable development –, to analyze the nutrient cycle in the soil, as well as to evaluate and expand it spatially. Rational soil utilization is also an important research area, as well as the maintenance of soil fertility (modern, environmental friendly agro-technical solutions and nutrient management, soil-friendly irrigation). Examination of the applicability of new research results and the examination of their effect on the success of farming.

Research results make it possible to improve the effectiveness of agricultural land use and regional development, while assuring that the interventions are environmental friendly and that they meet the requirements of sustainable farming.

The successful cooperation of the DS and the departments assures the high quality work of PhD students and their involvement in the international scientific life. A total 115 people registered, of which 47 are extension students, whereas 28 are individual ones. The number of those who graduated between 1999 and 2009 is 44.

After the upgrade of ILTR's RTD capacities the improvements and results will be exact and countable. Some examples:

- Creation of two new workplaces through the hiring of the two experts listed in WP3
- The new activities and the improved multilaterality of ILTR will help it keeping its current staff → number of preserved employees
- The detailed report of the infrastructural development will show the exact number of items and devices purchased
- The number of events where the project results were shown is also exact and countable
- Since the task of the incoming experts also covers lectures for the students of UD CASE, we can monitor the number of involved students as well

Better integration of ILTR in ERA as a whole

The improvement of the research potential of ILTR will have an additional impact through ILTR's contribution to the European research activities on the field of regional development, GIS and agricultural land use advisory. By unlocking the entire research potential of ILTR by means of the above mentioned infrastructural investments, human resource development and strategic partnerships with the networking institutions and other excellent research entities all of the possibilities of ILTR that are limited due to its financial situation will be entirely realized. The two-way scientific visits of the research staff of ILTR and the networking institutions will further build our competence giving an extra value to our future research turning ILTR capable to perform research of the highest quality. The network to be developed with excellent EU researchers will help ILTR to be incorporated into the main research streams and enable us to contribute to ERA activities.

As a result of the project ILTR will facilitate communication, dissemination and transfer of the obtained knowledge and experience, to other researchers from the convergence regions and the rest of the EU. Networking of ILTR and EU research will be maximized and a clear link will be created between the target groups and the research agenda. This will also help accelerate the collaboration of local and European scientists and develop additional partnerships within the ERA.

Some direct and countable results:

- Number of international publications on the relevant research topics
- Number of bilateral research agreements with international institutions

ILTR contribution to regional capacity building

As the physical location of the implementation of the project is in the North Great Plain region, therefore its importance in creating a regional balance cannot be questioned. Of the financial tools of the European Union created to implement its funding policy, Objective 1 of the Structural Funds refers to convergence that is the regions lagging behind have to be supported by investments in order to provide opportunity for catching up with the others. As there is a precondition that the region's GDP has to be lower than 75% of that of the EU average, our region unfortunately meets this requirement, thereby it is a target area of the funding.

The objective and methods of farming have gone through a dramatic change. The quantitative indicators and the technologies chasing world records were switched by technologies that pursue quality appearance on the market, risk reduction and then sustainability. The quality-focused approach to production adjusts production to the species, the variety, the phenological phase, but mainly to the market requirements of the product. From this aspect, there can be enormous differences in results among similar regional and soil endowments. The appearance of this difference is basically determined by the conscious and immediate utilization of the differences between professional knowledge and technological elements. Besides the tool demand of crop production technologies, the high standard satisfaction of needs for knowledge significantly increased. Due to the fact that the range of those interested became versatile, the need for credible, professional knowledge is dynamically increasing. The value of information is further

increased by timely circumstances like the effectiveness of sustainability, the implementation of the European harmonization and the process of environmental protection becoming stricter.

The objectives and results promote sustainable development, the creation of the European agricultural model, the development of a new, agricultural and food processing entrepreneurial and industrial structure, the increasing headway of economically viable plants, especially among individual farms, the increase of the efficiency of production and the proportion of competitive products, that slow down the development of regional differences and reduce the economic and social consequences of regional differences.

In accordance with the “New Hungary Rural Development Strategic Plan”, the project lays the foundation of and promotes the process of environmentally conscious farming becoming more widespread and the reduction of environmental load. The results of the program:

- developing a production structure adjusted to production site conditions
- improvement of the viability and production efficiency of farms
- improving the market position of producers
- the proportion of competitive and high quality products increases.

The number of successful cooperations with the target groups through our future technical advice service (practical utilisation of the infrastructural capabilities and R+D results of ILTR) will show the level of contribution to the local and regional capacity building. The mere existence of such a supporting service will help the target groups to perform on a higher level. The involvement of SMEs is also important, because they could be the most important beneficiaries among the target groups through the advisory services of ILTR.

Improvement of ILTR's potential to participate in FP7 projects

The proposed project activities and the high-quality experience of the networking partners will enable ILTR to access recent research results. These connections will not only update the current information basis of our organization, but they will even improve our knowledge on the research management and help determine new scientific targets. In the course of the project preparatory activities will be carried out together with the networking partners in order to establish a suitable basis for the creation of future joint research FP proposals. We are convinced that the achievements of the project (the infrastructural development, establishment of the GIS laboratory, the employment of new researchers, the two-way scientific visits and the promotional activities) will effectively contribute to the attractiveness of ILTR for future FP7 or later FP projects, in which we could prove our expertise in joint research activities as well. The number of submitted FP7 proposals will be a countable proof for our improved activity in terms FP7 projects.

Finally, the project will have general impacts on multiple levels:

- Local level: The University of Debrecen is one of the largest universities in Hungary. The improved capabilities will enable UD CASE and ILTR to provide new, diversified educational services as well (new courses, improved facilities, better quality of training). The improvement of the significance of the university is a great benefit for the local stakeholders as well
- Regional level: Agriculture is the most important sector in the North Great Plain region. Its development, the increase of its effectiveness is a strategic role of every public organisation related to agriculture. We believe, that ILTR and UD CASE will be able to contribute to this through its improved possibilities
- National level: Since ILTR would be the only educational facility in Hungary which possesses such technology and is able to carry out the related services, the national significance of the development is inevitable.
- EU-level: As Hungary and ILTR are situated in Central-East Europe, the help and support of the surrounding countries (not only EU countries, e.g. Ukraine), cooperation with them as well as knowledge and know-how transfer towards them might contribute to the sustainable scientific development of the entire region.

3.2 Dissemination and/or exploitation of project results, and management of intellectual property

The main challenge for ILTR regarding dissemination is to transfer and distribute the scientific and non-scientific information towards the target groups and the stakeholders in an effective way. In order to reach the widest circle of potential stakeholders and beneficiaries of the project ILTR intends to use various communication tools as shown above within the description of WP4.

The direct and indirect target groups are the scientific community, SMEs with agricultural production activities, independent agricultural producers, agricultural input (plant protection chemicals, seeds, etc.) producers, decision-makers, regional developments authorities, environmentalists and anyone who seeks sustainable agricultural production. By means of the already introduced communication tools/events (web-based activities, website, leaflets, CDs, meetings, conferences, mass media) ILTR intends to create a network of stakeholders and target groups which receives a comprehensive information pack during and after the project in order to be scientifically supported.

Sustainability of the project can only be ensured through high level communication. Since the University and ILTR have a very good relationship with the target groups, that goes back for numerous decades, the formation of such a network will not be difficult.

The communication will focus on the following components:

Introduction of the scientific results, proper communication of them to the scientific community

Informing the scientific community about the results of our project and the improved research capabilities of ILTR is a key activity, because other researchers may also benefit from our achievements. Sharing our improved knowledge and capacities is essential for the integration of ILTR into ERA.

Improvement of the visibility of both ILTR and its research activities

Both the participation at fairs and events and the organization of the two scientific conferences aim to let the public know about ILTR and the planned TAC. Proper visibility is essential for a research entity which plans to extend its scientific activities to the international level.

Attracting the European research community to co-operate with ILTR

One of the most obvious outcomes of the planned project is the enhanced reputation of ILTR. Every communication based event and tool will inform the European research community about the significant changes at ILTR and also about the improved potential which is needs to be utilized on the European level. The joint drafting and elaboration of further FP7 projects together with the networking organizations will also contribute to the attractiveness of ILTR as a research and scientific exchange partner.

Promotion of the close co-operation between researchers and agricultural producers

It is crucial to involve the main beneficiaries (agricultural producers) into the research process by disseminating its results towards them. The continuous information-transfer to the target groups and their constant feedback from their side is essential components in the scientific work of this project.

Improvement of the visibility of the North Great Plain Region, as a convergence region

As North Great Plain Region is one of the convergence regions, its only chance to overcome its disadvantageous characteristics is to become visible by achieving EU level results. By means of the project results, visibility of the region will improve.

Convincing local, regional and national policy-makers to integrate the research results and future technical advice activities of ILTR into the process of decision-makings

Beside the communication activities to be carried out in WP4, ILTR intends to keep constant contact with policy-makers in order to help create a long-term strategy for a sustainable agricultural production. The establishment of SB is part of this approach, because its members have certain influence to such issues. Therefore, besides helping the project create a long-term strategy for sustainability – as its primary objective – SB will also help by keeping contact with policy-makers.

Stimulating local researchers to initiate further participation in FP7 or later FP projects in order to improve the reputation of research carried out in the North Great Plain Region

The Framework Programmes are excellent instruments for a research entity to enhance its research experience and improve its reputation within the science community. Our goal is to stimulate local researcher groups to participate in later FP projects (prepare proposals or be consortium or networking partners in other proposals). We have made them understand, that joint research co-operations carried out within FP projects are excellent possibilities for them to become more acknowledged and higher quality research entities.

Management of intellectual property

The University of Debrecen established a central Knowledge Transfer Office. The task of this office is the centralized protection, management, dissemination and legal handling of every intellectual property produced in any proposal on any research field within the University.

This alone would ensure the proper management of intellectual property, but the staff of ILTR will do everything in its power to ensure that intellectual properties created in the course of the project remain harmless, will be transferred to the relevant target groups and will not be utilised without authorisation. Plagiarism will be avoided.

4. Ethical Issues

There are no ethical issues related to the project.

ETHICAL ISSUES TABLE

(Note: Research involving activities marked with an asterisk * in the left column in the table below will be referred automatically to Ethical Review)

	Research on Human Embryo/ Foetus	YES	Page
*	Does the proposed research involve human Embryos?		
*	Does the proposed research involve human Foetal Tissues/ Cells?		
*	Does the proposed research involve human Embryonic Stem Cells (hESCs)?		
*	Does the proposed research on human Embryonic Stem Cells involve cells in culture?		
*	Does the proposed research on Human Embryonic Stem Cells involve the derivation of cells from Embryos?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	X	

	Research on Humans	YES	Page
*	Does the proposed research involve children?		
*	Does the proposed research involve patients?		
*	Does the proposed research involve persons not able to give consent?		
*	Does the proposed research involve adult healthy volunteers?		
	Does the proposed research involve Human genetic material?		
	Does the proposed research involve Human biological samples?		
	Does the proposed research involve Human data collection?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	X	

	Privacy	YES	Page
	Does the proposed research involve processing of genetic information or personal data (e.g. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?		
	Does the proposed research involve tracking the location or observation of people?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	X	

	Research on Animals	YES	Page
	Does the proposed research involve research on animals?		
	Are those animals transgenic small laboratory animals?		
	Are those animals transgenic farm animals?		
*	Are those animals non-human primates?		
	Are those animals cloned farm animals?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	X	

	Research Involving Developing Countries	YES	Page
	Does the proposed research involve the use of local resources (genetic, animal, plant, etc)?		
	Is the proposed research of benefit to local communities (e.g. capacity building, access to healthcare, education, etc)?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	X	

	Dual Use	YES	Page
	Research having direct military use		
	Research having the potential for terrorist abuse		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	X	



FACULTY OF BIOSCIENCE ENGINEERING
Department Agricultural Economics

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Letter of Intent

Herewith, I the undersigned **Prof. Dr. Xavier Gellynck** as a key person on behalf of **Ghent University, Faculty of Bioscience Engineering, Department of Agricultural Economics** confirm the formal support to the proposal **"Improving research potential of the Institution for Land Utilization, Technology and Regional Development on the field of GIS, precision agriculture, land use and regional development"** prepared by the Institution for Land Utilization, Technology and Regional Development at the University of Debrecen, Centre of Agricultural Sciences and Rural Development to be submitted to the FP7-REGPOT-2010-1 call.

I confirm that as one of the networking partners we will assist the Institution for Land Utilization (ILTR) during the implementation of the activities planned in the proposal.

Prof. Dr. Xavier Gellynck

Ghent University
Department Agricultural Economics



Friedrich-Schiller-Universität Jena

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Jena, 08.12.2009

Letter of Intent

Herewith, I the undersigned Prof. Dr. Wolfgang-Albert Flügel as a key person on behalf of the Department of Geoinformatics, Hydrology and Modelling at the Friedrich-Schiller University, Jena (FSU-Jena) in Germany confirm the formal support of the proposal

"Improving research potential of the Institution for Land Utilization, Technology and Regional Development on the field of GIS, precision agriculture, land use and regional development"

prepared by the Institution for Land Utilization, Technology and Regional Development at the University of Debrecen, Centre of Agricultural Sciences and Rural Development, Hungary to be submitted to the FP7-REGPOT-2010-1 call.

I confirm that as one of the networking partners we will assist the Institution for Land Utilization (ILTR) during the implementation of the activities as defined and planned by the proposal.

.....
(Prof. Dr. Wolfgang-Albert Flügel)

GEOWISSENSCHAFTLICHE FAKULTÄT

GEOGRAPHISCHES INSTITUT

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23. November 2009

Letter of Intent

Herewith, I the undersigned Prof. Dr. Volker Hochschild as a key person on behalf of the University of Tuebingen confirm the formal support of the proposal "**Improving research potential of the Institution for Land Utilization, Technology and Regional Development on the field of GIS and regional development**" prepared by the Institution for Land Utilization, Technology and Regional Development at the University of Debrecen, Centre of Agricultural Sciences and Rural Development to be submitted to the FP7-REGPOT-2009-1 call.

I confirm that as one of the networking partners we will assist the Institution for Land Utilization (ILTR) during the implementation of the activities planned by the proposal.

23.11.2009

Prof. Dr. Volker Hochschild



UNIVERSITY OF
LINCOLN

Letter of Intent

Herewith, I the undersigned, Professor Mike Saks, as a key person on behalf of The University of Lincoln confirm the formal support of the proposal **"Improving research potential of the Institution for Land Utilization, Technology and Regional Development on the field of GIS, precision agriculture, land use and regional development"** prepared by the Institution for Land Utilization, Technology and Regional Development at the University of Debrecen, Centre of Agricultural Sciences and Rural Development to be submitted to the FP7-REGPOT-2010-1 call.

I confirm that as one of the networking partners we will assist the Institution for Land Utilization (ILTR) during the implementation of the activities as defined and planned by the proposal.

10/12/2009

Professor Mike Saks, Senior Pro-Vice Chancellor

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Letter of Intent

Herewith, I the undersigned Professor Jerzy Bański as a key person on behalf of Rural Areas Study Group, Institute of Geography and Spatial Organization Polish Academy of Sciences confirm the formal support of the proposal **"Improving research potential of the Institution for Land Utilization, Technology and Regional Development on the field of GIS, precision agriculture, land use and regional development"** prepared by the Institution for Land Utilization, Technology and Regional Development at the University of Debrecen, Centre of Agricultural Sciences and Rural Development to be submitted to the FP7-REGPOT-2010-1 call.

I confirm that as one of the networking partners we will assist the Institution for Land Utilization (ILTR) during the implementation of the activities as defined and planned by the proposal.

Warsaw, 23 November 2009



.....
Jerzy Bański, Professor

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Letter of Intent

Herewith, I the undersigned Andrew U. Frank as a key person on behalf of Department of Geoinformation and Cartography, TU Wien, confirm the formal support of the proposal **"Improving research potential of the Institution for Land Utilization, Technology and Regional Development on the field of GIS, precision agriculture, land use and regional development"** prepared by the Institution for Land Utilization, Technology and Regional Development at the University of Debrecen, Centre of Agricultural Sciences and Rural Development to be submitted to the FP7-REGPOT-2010-1 call.

I confirm that as one of the networking partners we will assist the Institution for Land Utilization (ILTR) during the implementation of the activities as defined and planned by the proposal.

Dec., 9th 2009

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 Department of Geoinformation and Cartography

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 A-1040 Vienna



www.geoinfo.tuwien.ac.at

Andrew U. Frank, Head of Department of Geoinformation and Cartography

The Institute of "Geoinformation and Kartographie" (E 127/1) is an organisational unit of the Technical University of Vienna according to §20/4 Universitätsgesetz 2002 (law for Universities). Head is o.Univ.Prof.Dipl.Ing.Dr.Andre Frank who is authorized by §27 Universitätsgesetz 2002.

UID Nr.: ATU 37 675 002



Letter of Intent

Herewith, I the undersigned **Dr. Béla Baranyi**, as a key person on behalf of the **Hungarian Academy of Sciences, Centre for Regional Studies** confirm the formal support of the proposal **“Improving research potential of the Institution for Land Utilization, Technology and Regional Development on the field of GIS, precision agriculture, land use and regional development”** prepared by the Institution for Land Utilization, Technology and Regional Development at the University of Debrecen, Centre of Agricultural Sciences and Rural Development to be submitted to the FP7-REGPOT-2010-1 call.

I confirm that as one of the networking partners we will assist the Institution for Land Utilization (ILTR) during the implementation of the activities as defined and planned by the proposal.

14th December, 2009



Prof. Dr. Béla Baranyi, DSc.
Head of Department