

Educating Professionals in Land Administration

Bela Márkus, *The University of West Hungary (Universidade de Hungria Ocidental)*

1. Changes in Education
2. Forming the National Spatial Data Strategy
3. National Spatial Data Infrastructure
4. Educational Strategy
5. SDiLA Institution Building
6. Conclusions
7. Acknowledgement
8. References

▶ Resum (*Resumo*)

1. Changes in Education

The move towards the information society is irreversible, and affects all aspects of society and interrelations between economic partners. An economy based on the creation, dissemination and exploitation of knowledge will be one of the dominant features of the 21st century, and will play a crucial role in generating a recovery in growth and an increase in employment. Fuller use of the potential offered by information and communication technologies can:

- create new service markets;
- facilitate provision of services by the private rather than the public sector, including a new partnership between the private and public sector, e.g. for training;
- speed up administrative decision-making procedures.

In a rapidly changing world, land administration must offer all employees greater opportunities for access to knowledge, irrespective of their age or social circumstances. This is why the notion of the educational and training needs to be understood in the broadest possible sense, both geographically and temporally. The wide range of these new challenges calls for a greater degree of integration between the fields of education, training and human policy. In order to be able to take an active part in the current processes of change, the employees should be able to develop their fund of knowledge on a continuous basis, thus continually expanding and renewing it. Developing employability through the acquisition of competencies made necessary through changes in work and its organisation. This means that it is necessary to promote on a lifelong basis creativity, flexibility, adaptability, the ability to 'learn to learn' and to solve problems. These are the conditions we must meet in order to avoid the now-rapid obsolescence of skills. Activities must be developed which help towards anticipating needs and towards the evolution of job profiles.

This problem can be overcome by a joint effort on the part of specialised training and higher education establishments. Cooperation between universities and the business world is another basic way of transmitting knowledge, a vector for innovation. Universities must also be given the resources they need to play their particular role in developing lifelong learning and continuing training. In association with public and private partners at national and

regional level, they can promote lifelong education, for example by retraining middle and senior management. In order for these measures to be as effective as possible, it is necessary to anticipate skills needs correctly and in good time by identifying the developing areas and the new functions to be fulfilled, as well as the skills required for them. Even if real-time adjustment is not possible (since a certain period of adaptation is inevitable), the organisation of as much research as is necessary in this area and the introduction of observation instruments and of mechanisms for transferring the information collected to the education system should make it possible to minimise the gap between required and available skills (EC communications, 1993, 1997).

In order to ensure the success of this process of adapting the system of education and training and to implement the measures set out above, it will not just be a question of increasing the level of public funding assigned to this area nor will the same increase be appropriate in all cases. The task is rather to reorganise educational resources in association with the employment services. In an extension of existing education and training programmes, the first objective should be to develop still further the corporate dimension of education: to improve the quality of training and to foster innovation in education by increasing exchanges of experience and information on good practices; to establish an area of training by recognition of qualifications; to promote physical mobility and the "virtual" mobility made possible by the new technologies of communication; to develop common databases and knowledge on skills needs; to conduct comparative research on methodologies used and policies implemented; to improve the interoperability of systems of distance learning and to increase the level of standardisation of the new decentralized multi-media training tools etc.

The teaching is not enough, it is the active (or *proactive*) learning which is essential. Placing learners and learning at the centre of education and training methods and processes is by no means a new idea, but in practice, the established framing of pedagogic practices in most formal contexts has privileged teaching rather than learning. Teachers traditionally convey the knowledge they possess to learners, who subsequently must show what they have learned. In this approach, teaching is largely proactive, whereas learning is largely reactive. The purpose of the process is essentially to convey content, and the core problem is to find the most effective teaching methods for doing so. Learners certainly participate in this process, but the extent of self-direction and co-determination they may bring to it is inevitably circumscribed.

In a high-technology knowledge society, this kind of teaching-learning relation loses efficacy: learners must become proactive and more autonomous, prepared to renew their knowledge continuously and to respond constructively to changing constellations of problems and contexts. The teacher's role becomes one of accompaniment, facilitation, mentoring, support and guidance in the service of learners' own efforts to access, use ? and ultimately create ? knowledge. This means that learners become active participants in their own learning processes, which they learn to negotiate and co-manage together with their teacher-guides and with their co-learners.

The significance of this kind of approach for learning for active citizenship is self-evident. Where the content of what is being taught and learned stands in contradiction to the way in which it is being taught and learned, the meaning of the learning process becomes ambiguous. Therefore, democratic and participatory pedagogies are especially important: they constitute the very essence of what is to be learned and practised. For this reason, too, the rich experience of non-formal youth and adult education and training is of particular value. Less consistently subject to the demands of assessment and certification and supported by the voluntary nature of learners' participation, these sectors have found it easier to develop and maintain symmetrical relations between teachers and learners. Similarly, youth workers and education/training practitioners working in these sectors have been able to develop a professional ethos in which pedagogic skills take priority vis-à-vis specialist expertise in a

recognised field of knowledge. In supporting the development of learning for active citizenship, the valorisation, exchange and dissemination of good practice in these sectors is likely to make a significant contribution.

2. Forming the National Spatial Data Strategy

The major reason given for the need to develop the National Spatial Data Strategy (NSDS) in Hungary is that the gathering of geospatial data is costly. The successful and cost effective implementation of the NSDS and use of the advanced GIS technology is important to support the dissemination of spatial data in the government administrations and other areas of the society. Data producers in the field share similar requirements for commonly needed data are sensible to develop a strategy, that accommodate joint implementation, development and maintenance programs. In addition, the wider distribution and use of data in geospatial technologies requires the development and use of standards. It also requires relevant professional skills and related knowledge for the application of land-related information systems.

The NSDS is based on six studies (Remetey, 2000):

- The first study focused on the macro-economic relationships. It investigated the impacts and anticipated benefits for the general administration and the private sector generated by investments in the spatial data infrastructure and use of service. Special emphasis was given to the issue of effectiveness based on investigation of larger spatial data application projects to clarify the National Spatial Data Infrastructure (NSDI) measures and actions needed to meet the requirements of the European Union and NATO accessions. A review of national spatial data strategies and infrastructures of the USA, EU, UK, and the Netherlands was also conducted.
-
- The second study analysed the legal issues related to geospatial data and information with the objective to localize the legal barriers that are partly based on relevant international legal practices.
-
- The third study was dedicated to the regulation issues. Investigated topics are data gathering, mandatory and optional tasks of the central government, the role of the local administrations in the establishment of the NSDI, promotion, and in the area of research and development. Recommendations resulting from this study identify: ways to share tasks and responsibilities between the main market players; ways to strengthen public private partnership (including outsourcing); tools and organizational actions that are needed to achieve better performance through coordination.
-
- The fourth study considered spatial data management issues concerning base data sets, their production, quality, maintenance, scheduling, and financial resources needed. Further investigations included spatial data accessibility, establishment of metadata services, applicable pricing policy and the economic interests of the data owners.
-
- The fifth study targeted quality-assurance and related standards, where international practices and standardization efforts of European and global organisations such as CEN, ISO and OGC were analysed.
-
- The sixth study highlighted marketing and public relation issues, inevitable for widening the dissemination of the spatial data and related services. The objectives to

be achieved were described: raising awareness, popularisation of the use of this technology as well as the development of more user-friendly and market-oriented systems, services and products.

These studies provided in-depth investigation on the present stage and provided the best practices at the international level. The goals to be achieved and alternatives for the applicable tools and methods for the NSDS have been recommended in a strategic document. This document contains a balanced system of objectives and corresponding actions that are fully in line with the implementation of the Information Society Action Plan. The NSDS consists actions in the legislation, standardisation, commercialisation, PPP, education and training, research and development, domestic, cross border and international co-operations and institutional networking among the technological projects. The NSDS offers a unified structure for spatial data infrastructure based projects that are being planned, are defined, or are already implemented, such as the following:

- National Cadastre Program
-
- National Topographic Program
-
- The Aerial Survey of Hungary
-
- Unified, geo-referenced address registry, a solution to provide interoperability between different address based public inventories and services
-
- A multipurpose Parcel-based Information System primarily devoted to support agricultural, environmental and rural development related subsidies such as the integrated administrative and control system of the EU's Common Agricultural Policy.
-

3. National Spatial Data Infrastructure

In Hungary there is a strong tradition in land registry and cadastre that goes back to the Austrian-Hungarian empire. It is therefore developing a computerised integrated system containing both textual and cadastral data using the application tailored TAKAROS (networking) and META (GI) systems.

Core Data: The legal, ownership element of the land registry is now in 100% digital format. Around 4% of the cadastral maps were available in digital format in 1998, 15% is anticipated for 2002. Basic topographic maps at scale 1:50 000 have full coverage in digital format, while approximately 5% of the country is covered by digital maps at scale 1:10 000. A significant activity being undertaken in digitising (at this time scanning) existing large-scale maps. Standardised and detailed information on the digital availability of socio-economic and statistical data and a detailed gazetteer can be found on the homepage of the Central Statistical Office. The TAKARNET data transmission network of the Land Administration (<http://www.takarnet.hu>) provides wide range of information on core spatial data, products and services.

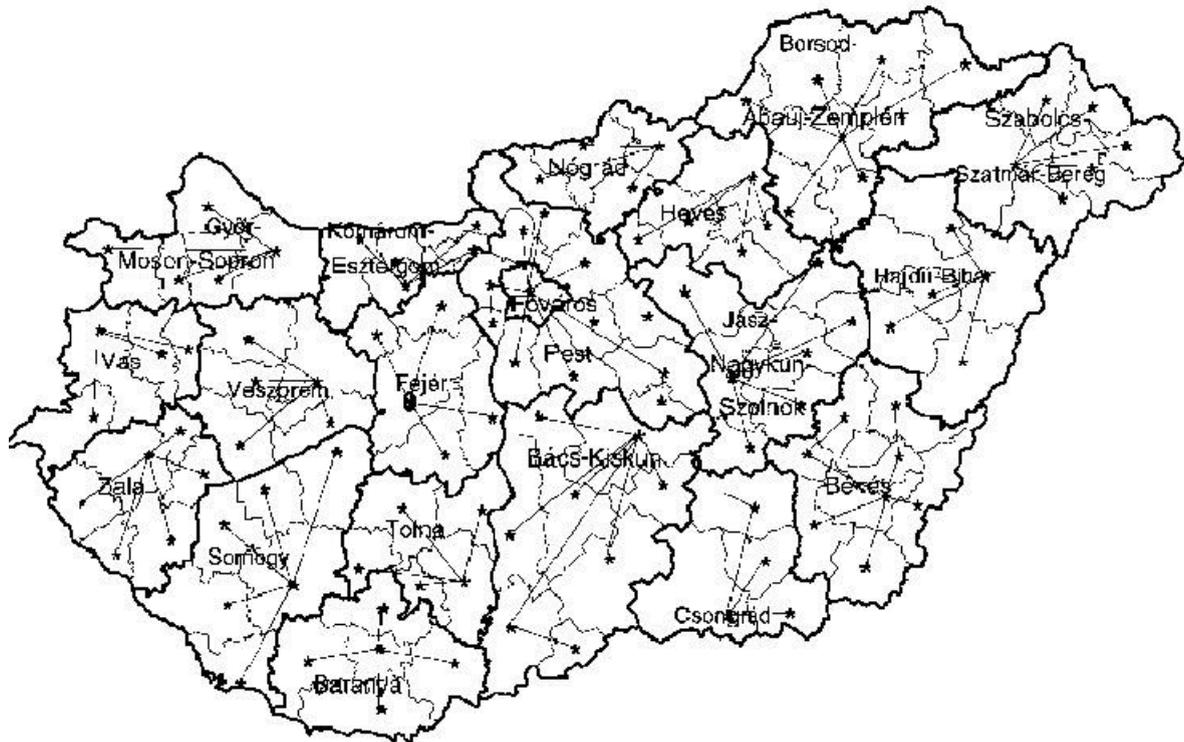


Fig. 1 : TAKARNET is an Intranet, connecting Hungarian Land Offices

Two metadata servers have been set up, METATÉR Server at the Geological Institute of Hungary, (<http://meta.mafi.hu>) supported by the Prime Minister's Office and FISH (<http://fish.fomi.hu>), with a server at the Institute of Geodesy, Cartography and Remote Sensing (FÖMI).

Coordination: a national policy on data access and sharing is being developed by an Inter-ministerial Committee on Informatics under the support of the Prime Minister's Office. Another inter-agency committee is co-ordinating the digital map acquisition co-chaired by the two ministries with responsibilities in this area.

In respect to the key elements of a national spatial data infrastructure, there is significant progress being made at all levels, including legislation, technology, education and training, data, and overall institutional framework. PHARE, TEMPUS and other R&TD funding are proving beneficial for this purpose as well as the linkage of HUNAGI, the umbrella organisation for GI, with EUROGI in raising awareness further at national and local levels. Key issues for the future include the implementation of the framework being developed, and accession to the EU. This is being prepared through a national programme for the adoption of the EU's *acquis*.

4. Educational Strategy

The criteria for entry to the EU established at the Copenhagen European Council of June 1993 include the existence of a functioning market economy as well as the ability to cope with competitive pressures and market forces within the Union. Fundamental to this is the

existence of a sound and flexible system of Land Administration, to apply the *acquis*, and identified elements essential in the land administration. In Hungary the education and professional development of this system has since 1973 been supported by CSLM. Under the aegis of CSLM considerable advances in technology and in corresponding education support have been made since 1989. However, there remain weaknesses in CEE countries that are critical for meeting the EU criterion and for addressing the issue of Institution Building. These were identified in the United Nations Meetings of Officials in Land Administration (UN MOLA) Workshop on Land Market in 1998 in Budapest: Lack of education in the management, legal, economic, human and ethical aspects of land administration, General lack of user oriented approach to education, Lack of continuity in education from universities to professions and appropriate linkage between the two (Markus, 1998).

A Strategic Committee for Staff Development in Land Offices was formed by the Ministry of Agriculture and Rural Development (MoARD) Department of Lands and Mapping (DLM) in 1997. It was recognised by the Committee that human resources were the most important aspect of service delivery in Land Administration. When the speed of change in information technology is placed alongside the transition changes of land ownership and measurement within Hungary, a need for education and training has become paramount. The educational system must be made more responsive to the customer and, with this in mind, a system of open and, very often, distance education was proposed.

Beyond the modernisation of the state administration, it is also worth mentioning that such a huge data base - property sheet data relating 9 million land parcels and/or other real estates, map data of 55 000 cadastral maps etc. - is maintained by the land office network on very expensive computerised equipment, the reproduction expenses of which is about 100 billion HUF. The efficient handling, updating and maintenance of this data infrastructure needs highly qualified properly trained staff. This will reinforce consistency, common identity, shared corporate culture, common actions, clear responsibilities, coordination and dissemination of good practice. Land Offices need to adapt and modernise their education and training systems (Niklasz, 1999).

Success factors in staff development

- Improving the skills of management,
-
- Strengthening the efficiency of the work and its service-oriented character,
-
- Providing the land management sector with competitive national working power,
-
- Supporting the spread of new forms of work,
-
- Preparing land administration for the participation in the information society,
-
- Providing opportunity for lifelong learning,
-
- Creating motivation for continuous training.
-

5. SDiLA Institution Building

The Regional and District Land Offices in Hungary maintain and update the property records which include both large scale (cadastral) maps and the legal and administrative records of

Hungary. The economic transition process has exposed weaknesses in the existing land registration system in Hungary and many of these are being addressed through the EU PHARE "Computerisation of Land Offices" Project. The CSLM realised these needs and started a TEMPUS Joint European Project in 1995. The OLLO (Open Learning for Land Offices) project aimed to support the transition, providing a modernised land registration sector which will ensure safe and secure management of the land and property ownership records which consist of land administrative and legal records and cadastral maps. This project involved an estimated expenditure of 15 million ECU and involves the complete reform and modernisation of the land registration system of Hungary.

The OLLO SJEP ended in 1998, developed a set of 14 teaching modules, for study by distance learning for use by staff in the Hungarian land office network. This project has met all of its aims and objectives and is now making a significant contribution to the development of staff in the land office network and through this it is making a valuable contribution to the achievement of the PHARE computerisation of land offices project.

The OLLO programme

- has allowed new methods to be introduced, technologies and QA process learned and attitudes changed at CSLM
-
- is to be used as the nucleus for the course curricula for the pilot courses and has produced the base knowledge for the knowledge pool in the 14 modules developed
-
- has ensured the quality of materials and delivery has improved and refinement of courses assured
-
- has enabled a language experience for CSLM staff
-
- introduced new computer techniques, multimedia development tools and learning resources at the whole faculty, however, IT changes rapidly and there needs to be continuous upgrading
-
- has aided in making courses self-financing, allowing essential income to CSLM
-
- has enabled the materials and technology created in OLLO to be used in the standard full-time programmes
-
- has introduced a flexibility of programme delivery that has been advantageous to other courses (e.g. cadastral programme)
-
- has created new contacts and thereby allowed new projects to be initiated
-
- has widened the experiences in educational management
-
- has allowed ODL to become a familiar and useful professional development method in the land surveying profession in Hungary
-
- initiated a CPD strategy in the Hungarian land office sector
-
- laid the foundation for international recognition of CSLM
-

- laid the foundation for europeanisation of land surveying profession and of land surveying education in Hungary

●
OLLO has successfully introduced new approaches to teaching and co-operation and has significantly strengthened CSLM as a centre in professionally oriented land information management programmes. While OLLO was partly retrospective in nature in that it sought to fill an educational gap that had become obvious through the requirements of the PHARE programme. To fulfil the new needs generated by the infrastructural changes and for the involvement of new techniques available CSLM initiated in 1999 a new TEMPUS project. SdiLA (Staff Development in Land Administration) project is widening the target area and looking forward the needs arise from the opportunities, which now exist or under preparation in Hungary in connection with the EU accession.

Principal amongst these requirements for the future is the need to disseminate a broad understanding of the ways in which land related data can be used, particularly in preparation for accession to the EU. Such degrees of understanding and competency must also be spread through relevant areas of the civil service and must not be isolated in pockets of the land administration sector. Thus, while OLLO sought to target the professional land officer, such defined posts are not targetable in the civil service at large and thus attempts are made in SDiLA to reach an audience covering a range of job functions and at differing levels of responsibility.

Thus, where OLLO has developed a firm educational foundation for professional staff, SDiLA now seeks to build towards a more flexible programme of short cycle staff development activities. This differs from OLLO in that study will not be part of an overall academic programme, it can thus be more flexible and will be targeted in different ways towards differing levels of ability and differing staff requirements. SDiLA will be able to call upon the network resources of TAKARNET and will thus be able to take full benefit of CBT techniques.

There are three SDiLA project objectives. First, the creation of a programme of education for continuing professional development for Land Administration in Hungary based on existing programmes developed under the OLLO TEMPUS Project and other projects in Hungary and the EU. These will utilise the existing Land Administration infrastructure. To these will be added new programmes for higher management and a set of programmes for all levels in Land Administration focusing on organisational issues, on skills and on matters pertinent to EU entry. In seeking to achieve these objectives, the project will develop a core base of knowledge in land administration matters, the *Knowledge Pool*, which can be used in a flexible manner as a part of staff development programme tailored to individual's requirements. By building on the highly successful OLLO (Open Learning for Land Offices in Hungary) Structural Joint European Project the project will create an even more flexible and widely applicable staff development resource that can be used by individuals from many civil service disciplines. The provision of such a resource is essential for adequate staff development to support staff preparing for Hungary's accession to the EU and the consequent demands this will place upon them. The SDiLA TEMPUS Institution Building project will update / improve the structure and develop 3 vocational short courses, and a senior management course in land administration.

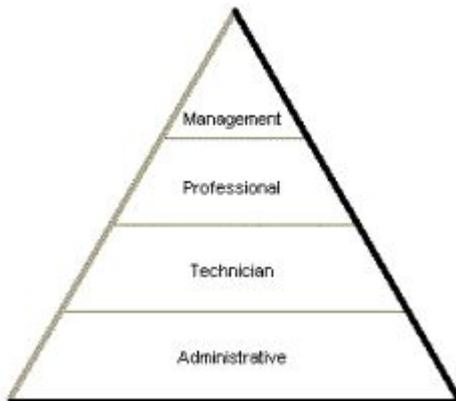


Fig. 2 : SDiLA - target groups and professional levels

Second, the creation of a *delivery system* for continuing professional development based on a management system and education technology, both CD and Web, with a comprehensive credit system. The operation of a knowledge pool will depend on the creation of a database of education resources and on a metadata system that will provide the flexibility needed for supporting professional development. The specifications for such systems are becoming available from the Instructional Management Systems (IMS) initiative and compliant databases are already available from the project partners. CSLM and the project partners already have considerable experience of the education technology needed to deliver the proposed programme. The UNIGIS network of universities is a major provider of professional education and an active developer of web and other education technologies that are available to this project. These will be adapted to the specific requirements of the Hungarian Land Administration system.

Third, the creation of a *network of EU centres* and education providers with the objective of participating fully in EU activities in Land Administration and the EU professional community. The partner institutions are each active in the field of professional development and there are other institutions in the EU which have long standing links with CSLM. This network will be used to establish the dialogue necessary for planning the maintenance of quality in professional practice throughout the EU. The Land Administration professions are undergoing rapid change because of the radical changes in technology and there is a continuing need for the professions to retool and adapt. Changing standards and practice at EU level requires continuous updating.

The course material development is based on knowledge pool approach and the course delivery on a distributed environment using a network of Technical High Schools in Land surveying and TAKARNET (see Fig. 1). The CSLM acts as a knowledge centre developer, land office study centres and high schools are dealing with course delivery. This necessitates the extended use of metadata on the educational resources.

Metadata will be crucial in implementing these strategic elements. Whilst learning units itself forms the building blocks of networked and inter-connected environment metadata is required to bind the units together and allow them to interoperate. Metadata is required to describe what learning units look like, how to build from them a learning route, what, if any refinements or value adding operations have been carried out on a unit. And in a networked environment what services can a tutor/learner request from a server and what parameters should the teacher/student send to the server to request the service.

6. Conclusions

The Bathurst Declaration (1999) documented well that increasing public awareness, developing appropriate institutions and advancing their maturity are critical to the achievement of the aims of securing sustainable development, and for the recognition of the role of land in this context. It is recommended that governments be encouraged to re-engineer their land administration systems so that they better serve the needs of all levels in society. The Declaration recommends in view of the crucial importance of human resources in the management of land, *ensure* that there is sustained education and training in land administration. In particular, international agencies should seek to develop multi-disciplinary, multi-national training courses in land administration and make these available at the local level through the use of modern information technology.

The work within the OLLO programme has produced a sound platform and structure for the education and training in the Land Offices. The open, distance education format has enabled employees from the whole country to register onto the course and complete the necessary units without losing time at their workplace. It can be said that CSLM have created an excellent basis for Staff Development and Training. This structure could easily form the basis for exportation to other countries. The structure depends on individual units that could be studied as a stand-alone unit or that could build into a course that could lead to a MSc level qualification. The content of the courses is a different matter. A significant percentage of the course is sufficiently generic to allow for it to be incorporated into similar courses in other countries. The course however could not be used in its entirety in any country other than Hungary. It is also interesting to note that even in Hungary the content of the courses has been adapted for different educational and training purposes. The more technically based National Cadastre Programme being the most important example.

The SDiLA Project will improve the knowledge transfer from the developed countries to Hungary and allow CSLM to really participate in the international educational development arena, rather than to become simple user of systems and regulations invented by others. SDiLA aims to increase collaboration between EU and Hungarian institutions and sharing of learning resources. Co-operation will support specialization, improve quality, increase choice, and lead to a better fit with changing vocational demands in Land Administration. The job market in general will become much more dynamic, complex and heterogeneous. The increased complexity will increase the difficulty of optimising job offers and job demands. SDiLA assists to avoid these problems and to develop more market oriented curricula. Since the strategic aim of SDiLA is directly support a European accession, the project will improve interaction beyond national boundaries and will facilitate the development of standards. Potential clients of SDiLA include not only Land Office staff, but professionals in land surveying, local governments, regional offices etc. The openness of SDiLA will also allow partners from other countries to participate in the dissemination.

7. Acknowledgement

The SDiLA project was initiated and is managed in close co-operation with Graham Brown (University of East-London) and James Petch (Manchester Metropolitan University). The review on NSDS and MoARD's educational strategy is based on discussions with key participants at MoARD and the excellent papers composed by Gábor Remetey-Fülöpp (2000) and László Niklasz (1999). The author would like to express his gratitude for their consistent advice and also for their help in writing this paper. The SDiLA project is funded by the TEMPUS PHARE programme. The partner institutions are grateful to the EU for their support.

8. References

- White Paper on growth, competitiveness, and employment: The challenges and ways forward into the 21st century, Communication from the European Commission, 1993.
-
- Towards a Europe of knowledge, Communication from the European Commission, 1997.
-
- Márkus, B.: Building a knowledge pool for land administration, UN ECE MOLA Meeting on Land Market, Budapest, 1998.
-
- Niklasz, L.: Strategy of Staff Development in Hungarian Land Offices, FIG Commission 3 Annual Meeting and Seminar, Budapest, 1999.
-
- Bathurst Declaration: Report on the Workshop on Land Tenure and Cadastral Infrastructures for Sustainable Land Development, Bathurst, 1999.
-
- SDiLA project document, London - Manchester - Salzburg - Szekesfehervar - Vienna, 2000.
-
- Remetey-Fülöpp, G.: The Role of the Public Private Partnership in the Lands and Mapping, Segment of the Hungarian National Spatial Data Infrastructure. Invited lecture. Conference of the UN ECE Working Party of Land Administration. Tirana, 30th March - 1st April, 2000.
-

Autor Prof. Dr. Bela Markus
 The University of West Hungary
 Department of Geoinformatics
 College of Surveying and Land Management
 97040-500 xxx - Hungria
 ✉ mb@cslm.hu