The e-Future Challenge

Stig ENEMARK, Denmark

Key words: e-Governance, e-Citizenship, Knowledge Management, e-Learning, FIG

SUMMARY

This paper provides an overview and some key points in relation to the three areas: e-Governance, Knowledge Management, and e-Learning. In common these areas constitute what could be named “the e-Future Challenge”.

In this paper e-Governance is discussed in relation to the land management paradigm. A land management vision is presented that incorporates the benefits of ICT enabled land administration functions. The idea is that spatial enabling of land administration systems managing tenure, valuation, planning, and development will allow the information generated by these activities to be much more useful. For governments, achievement of sustainable development goals will be easier to evaluate and the building of suitable land policy frameworks will be assisted by better information chains. Also, the services available to private and public sectors and to community organisations should commensurably improve.

The concept of Knowledge Management relates to e-Governance as well as to e-Learning. There is a need for sharing of knowledge and resources when designing the future national IT-architecture for spatial data. And there is a need for sharing of knowledge and resources when designing concepts of e-Learning suitable for bridging the gap between academia and professional practice.

Finally, this paper looks at e-Learning as a response to modern ICT opportunities. The concept of Learning Lab Geomatics is developed at Aalborg University to provide a new and flexible learning environment based on e-Learning and Knowledge Management. It is, however, not fully implemented. The concept will, in turn, provide educational innovation through a more focused self-learning perspective, and it aims to provide an efficient interaction between education, research and professional practice at national as well as international level.

1. INTRODUCTION

Modern ICT offers a whole range of opportunities and, at the same, imposes all kind of challenges to be faced by professional communities such as the surveyors. This relates especially to areas such e-Governance, Knowledge Management, and e-Learning. These areas interact and respond mutually. Developments move fast and it is not easy to catch up. The focus of this joint commission workshop is therefore very timely.

2. GOOD E-GOVERNANCE

Governance refers to the manner in which power is exercised by governments in managing a country's social, economic, and spatial recourses. It simply means: the process of decision-making and the process by which decisions are implemented. This indicates that government is just one of the actors in governance. The concept of governance includes formal as well as informal actors involved in decision-making and implementation of decisions made, and the formal and informal structures that have been set in place to arrive at and implement the decision.

Good governance is a qualitative term or an ideal which may be difficult to achieve. The term includes a number of characteristics e.g. as identified in the UN-Habitat Global Campaign on Urban Governance. The characteristics or norms are as follows (adapted from UN-Habitat, 2002):

- *Sustainability:* balancing social, economic and environmental needs while being responsive to the present and future needs of society.
- *Subsidiarity:* allocation of authority at the closest appropriate level consistent with efficient and cost-effective services
- *Equity of access:* Women and men must participate as equals in all decision making, priority setting, and resource allocation processes
- *Efficiency:* Public services and local economic development must be financially sound and cost-effective.
- *Transparency and Accountability:* Decisions taken and their enforcement follows rules and regulations. Information must be freely available and directly accessible.
- *Civic Engagement and Citizenship:* Citizens must be empowered to participate effectively in decision-making processes.
- *Security:* All stakeholders must strive for prevention of crime and disasters. Security also implies freedom from persecution, forced evictions and provision of land tenure security.

Once the adjective "good" is added, a normative debate begins. Different people, organisations, and government authorities will define "good governance" according to their own experience and interests. E.g. it may be argued that issues such as rule of law, responsiveness, and consensus orientation should be added to list above. The term good governance can also be viewed in several contexts such as corporate, institutional, national, and local governance. In any case, almost all kind of government includes a spatial component. In other words: Good governance and sustainable development is not attainable without sound land administration or – more broadly – sound land management.

2.1 The Land Management Paradigm

Land management is the process by which the resources of land are put into good effect (UN-ECE 1996). Land management encompasses all activities associated with the management of land and natural resources that are required to achieve sustainable development. The concept of land includes properties and natural resources and thereby encompasses the total natural and build environment. Land administration is an area dealing with rights, restrictions and responsibilities in land. This relates to the interaction of the three areas of land tenure, land value and land use. By including land development these four areas are called the Land Administration Functions. These functions are based on policies determining the overall objectives and they are managed on the basis of appropriate land information infrastructures providing complete and up to date in formation on the natural and built environment. This all sits within a country/state context of institutional arrangements that may change over time.

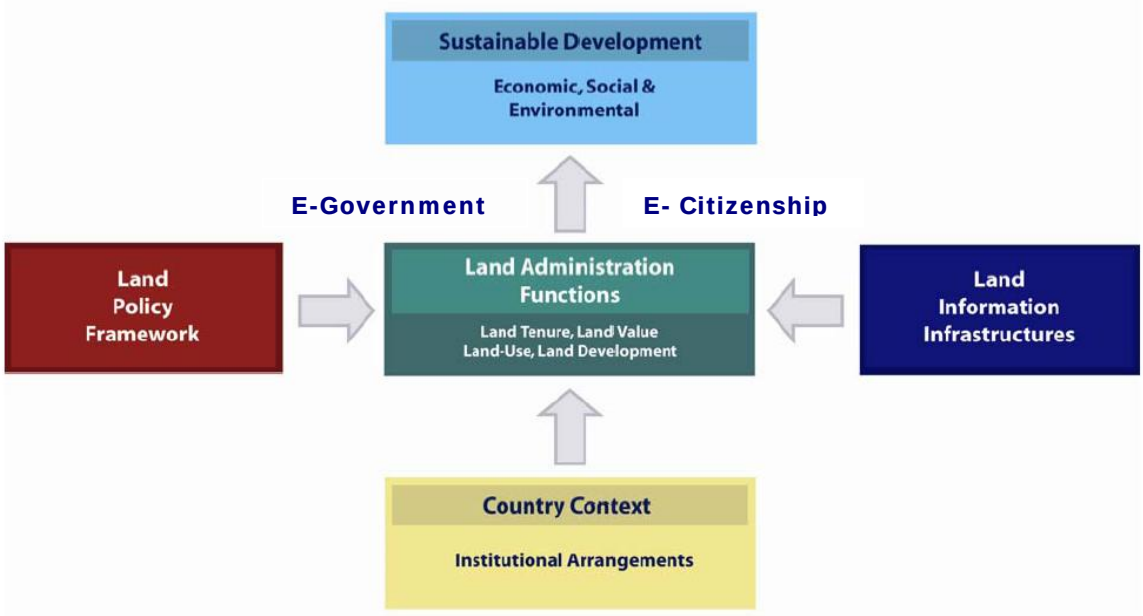


Fig. 1. The Land Management Paradigm (Enemark, 2005).

Land management in developed economies should facilitate sustainable development – the triple bottom line of economic, social and environmental sustainability – through public participation and informed and accountable government decision-making in relation to the built and natural environments. The interface between the land administration infrastructure and professions and the public will increasingly be serviced by information communication technologies designed to implement e-government and e-citizenship. These processes will be used to link systems and information to people who would then be involved in delivering sustainable development at the local level. E-citizenship is mobilisation of society to engage in planning, use and allocation of resources, using technology to facilitate participatory democracy. E-government involves a government putting government information and processes on-line, and using digital systems to assist public access. E-governance is e-democracy – helping to govern society through the use of the Web.

2.2 Spatial Enablement

Since 1990, land administration in modern democracies emerged from a technical focus aiming at serving professionals, institutions, and governments to a wider scope of serving citizens and businesses. This requires an understanding of how spatial enabling works.

On one standard, spatial enabling is just one form of interoperability (capacity for a computer to identify "where" something is). It is, however, far more energetic and offers opportunities for visualisation, scalability, and user functionality. The capacity of computers to place information in on-screen maps and to allow users to make their own enquires has raised the profile of spatial enablement. Thousands of new applications of this technology (mobile phones, vehicle tracking, digital cameras, and intelligent systems in asset management) are developing annually. These rely on the underpinning of spatial information i. information in cadastre, land administration, and large scale topographic maps. The benefits of spatial enablement of the core cadastral layer are (Wallace et. Al. 2006):

- Maintenance and sharing of the core information layer – once created it is used many times – already used in thousands of applications
- Attachment of information to images of parcel and property configurations
- Accurate identification about the place or location of one activity in relation to other places in ways that are understandable by ordinary and non-technical people
- Capacity of businesses and citizens to understand, interrogate and manipulate information in the computer
- Inclusion of layers of geo-referenced information in the computer systems, despite their distinct sources, systems and owners, and achieve interoperability between the layers
- Integration of government information systems and provision of seamless information to institutions and government
- Incorporation of a spatial and relative information into maps permitting the location of that information to be realised and visualised
- Ultimately managing information through spatially enabled systems, rather than databases.

Spatial enablement offers land administration a revolution equivalent to the conversion of paper files to digital systems of twenty years ago. However this is not the end of the story – researchers, practitioners, big business and government are now seeing the huge potential from linking "location" or the "where" to most activities, polices and strategies, just over the horizon. Companies like Google and Microsoft are actively negotiating to gain access to the world's large scale built and natural environmental data bases.

2.3 A Land Management Vision

The Land administration function of land registration and tenure, valuation and taxation, planning and regulation, and development, are the institutional core of modern economies. These functions will, however, undergo changes as they adapt to the new policies of sustainable development, demand driven processes, acceleration in take-up of spatially

enabled systems, and the historical and cultural realities. How a particular jurisdiction responds will depend on the understanding of the vision be its leaders.

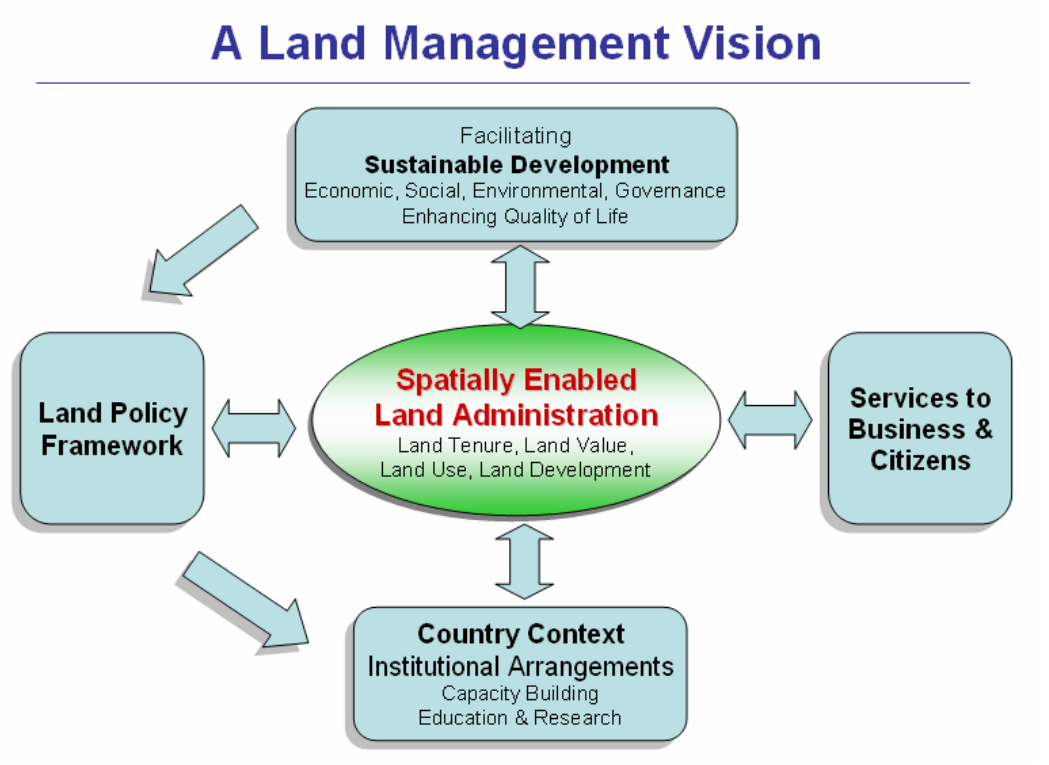


Fig. 2. A Land Management Vision (Expert Group Meeting, Melbourne, November 2005)

The idea is that spatial enabling of land administration systems managing tenure, valuation, planning, and development will allow the information generated by these activities to be much more useful.

Firstly, the achievement of sustainable development goals will be easier to evaluate since adaptability and useability of modern spatial systems will encourage much more information to be collected and made available. For governments, building a suitable land policy framework will be assisted by better information chains. *Secondly*, the services available to private and public sectors and to community organisations should commensurably improve.

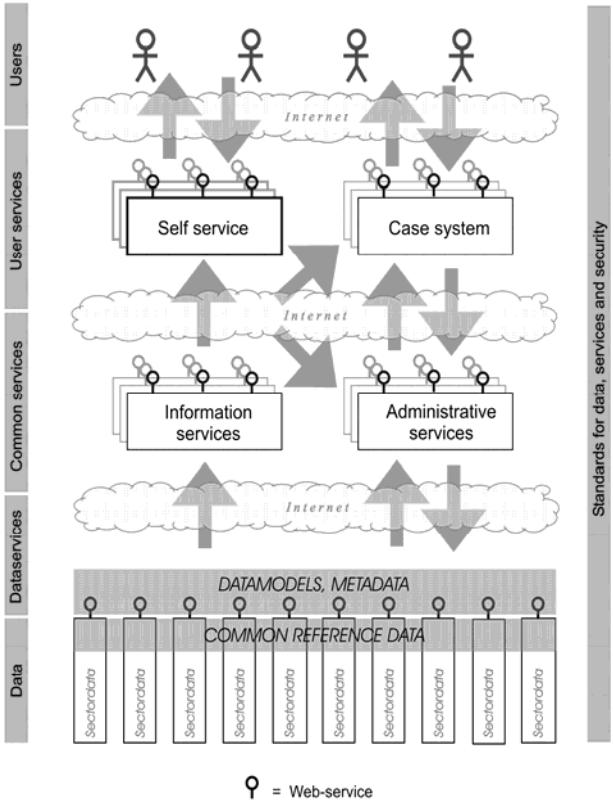
Ideally these processes are dual: with modern information and communication technology, the engagement of users in design of suitable services, and the adaptability of new applications should increase and mutually influence. The global initiatives are the starting point, but in a national case, modifications to suit the particular context will be built. The new land administration systems of the future will be local, regional and global in their capacity.

3. KNOWLEDGE MANAGEMENT

The concept of Knowledge Management is about optimising the use of the basic asset of any organisation namely knowledge. Knowledge Management is basically an integrated approach to managing the information assets of an organisation/enterprise. These information assets may include databases, documents, policies, procedures, or just knowledge stored in the individual's heads. (Markus, 2005). Knowledge Management, this way, is just common sense. However, in reality, the state of knowing or having access to the right knowledge at the right time is a real and important business advantage.

3.1 Knowledge management in e-Government

Knowledge management is about organising and sharing of knowledge just like spatial information management is about organising and sharing of spatial data. This is of course a simplification since knowledge management is a broader concept. However, in relation to e-Government knowledge management is then basically about designing and implementing suitable spatial data infrastructures or, more particularly, it is about designing and implementing a suitable IT-architecture for organising spatial information that can improve the communication between administrative systems and also establish more reliable data due to the use the original data instead of copies. In Denmark, such governmental guidelines for service-oriented architecture e-government are recently adopted.



Users: All kind

User services:
Self services collect and organise dat from different sources for specific purposes
Case systems design and support the processes in government administration

Common services:
Information services support the distribution of data
Administrative services secure the process of access to and updating of the data

Data services: Provide functionality For distribution and administration

Data: Official (authentic) governmental Registers and map databases
- o Quality, authenticity, and actuality
- o Flexibility and accessibility
- o Standardisation

Fig. 3. The Danish concept for service-oriented IT-architecture.

The key elements are: (i) *Flexibility* and *accessibility* which facilitates decision-making at all levels, (ii) *Quality*, *authenticity* and *actuality* due to direct access for reading and updating in the basic databases, and (iii) *Standardisation* through homogeneously selection of communications and exchange standards such as XML etc. This is currently being applied in the area of land administration through close cooperation between the agencies and stakeholders involved.

3.2 Knowledge management in e-Learning

The School of Surveying and Planning at Aalborg University has established a system of on-line management of the study environment. This means that all information and communication is managed through the web. Home pages and email addresses are available at all levels including each student, each group of students, and each semester.

To improve implementation of IT in all aspects of the learning environment the School has established a Spatial Data Library to serve the educational process. The Spatial Data Library contains all relevant spatial data (registers and maps) within the region of northern Denmark. The students project work, this way, is based on the actual data and the work is undertaken at the same level of IT as in professional practice. The library also enables the lecturing to be on-line when teaching theories and applications. A full-time librarian is responsible for maintaining the data sets and for developing relevant applications.

The School has also established a one-year Master course in Geographic Information Management. The course was developed in co-operation with the surveying industry and the Danish Association of Chartered Surveyors. The course is offered as a one-year part time study lasting for two years, and it is organised as distance learning using an electronic classroom for teaching and communication. Researchers from other regions in the world such as University of Melbourne and ESRI in California are lecturing on-line in this course. The course combines lecture courses (distance learning) with supervised project work (distance communication) based on professional problems identified by the practitioners within their respective employment areas. The students take part in four weekend seminars organised each year on campus to have introductory classroom lecture courses and to discuss and develop their project work. In general, the concept provides an innovative interaction between university and industry and it provides valuable feed-back to be integrated in the full time graduate program. These experiences in knowledge management are further developed in the concept of Learning Lab Geomatics that is presented in more details below.

4. EVOLUTION OF E-LEARNING CONCEPTS

Developments in the communication technology have had a huge effect on the learning environments at universities all over the world. From focusing on the local learning environment and its available learning tools, the universities are now facing a situation, where the students just under their fingertips – and with the same speed as their own thinking and capacity for formulating questions – have access to the pool of knowledge throughout the world. Consequently, not only the role of the professor is changing, but also the whole university institution and the principles of learning in relation to both

methodology and pedagogy. The role of the universities will have to be reengineered based on this new paradigm of knowledge sharing.

The surveying community around the world is a combination of academia and practice. The profile of the community is changing rapidly due to the global drivers such technology development and globalization. For the two partners – the academic world and the world of professional practice – one possible way forward is to foster a cross-functional and cross-sectoral collaboration through setting up virtual learning organizations and facilities which can benefit both partners. Learning Lab Geomatics can be seen as such an organization

4.1 Learning Lab Geomatics

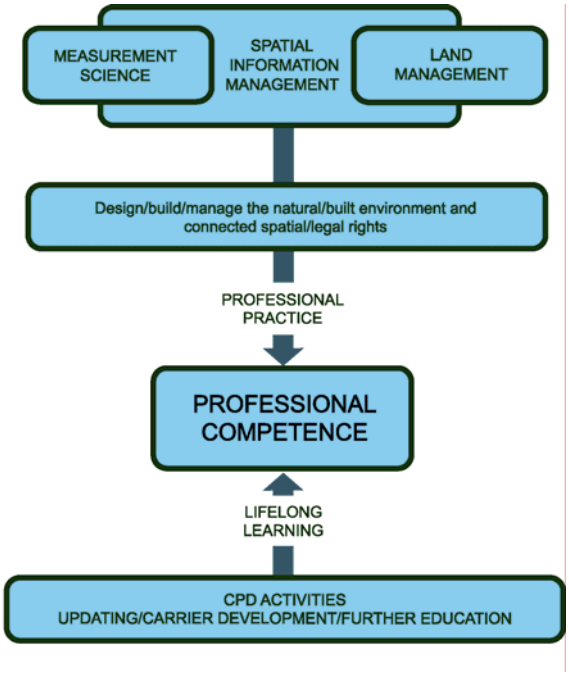
Learning Lab Geomatics is a strategy for implementing the concept of e-Learning in area of educating surveyors at Aalborg University (Enemark and Sorensen, 2002). The strategy includes a number of elements such as reengineering the learning process through web-based lecture materials; pedagogical innovation in the learning process; and internationalization of the total study environment.

The learning environment at Aalborg University is based on a project-organised approach. "Project-organised" means that the curriculum is taught through project work assisted by lecture courses instead of teaching theoretical courses assisted by practical labs. The learning process will be improved to reflect the opportunities provided through the modern information and communication technology. Lecture course material will be designed and prepared in hypertext and made available on the web as a basis for more intensive preparation and self-studies to be undertaken by the students. Traditional classroom lecturing will increasingly be replaced by web based self-studies followed by tutorials. The student's project work will be developed on web-sites and the resulting final report will be made available as a source of knowledge to be used by incoming students. The outcome of the learning process will be improved by not only enhancing the competence of the graduates but also by improving the accessibility to knowledge.

The changing role of the universities should include that the lecture course materials, research results, and professional journals be made available on the web and packed in way tailored for use in different areas of professional practice. The graduates will then have access to the newest knowledge throughout their professional life.

4.2 EDUCATIONAL INNOVATION

Learning Lab Geomatics is designed to provide a new and flexible learning environment based on knowledge management. It is, however, not fully implemented. The concept will, in turn, provide educational innovation through a more focused self-learning perspective, and it aims to provide an efficient interaction between education, research and professional practice at national as well as international level.



The Professional Competence Model

Professional competence relates to the status as an expert.

This status cannot be achieved only through university graduation and it can not be achieved solely through professional practice.

University graduation is no longer a ticket for a lifelong professional carrier. Today one must qualify constantly just to keep up.

The idea of "learning for life" is replaced by the concept of lifelong learning.

E-Learning is essential in this regard

Fig. 4. The Professional Competence Model.

When the lecture material is available on the web in a special designed version it will be possible to change the performance of the lecture courses in an innovative way. More time may be allocated to self-studies based on the web-based material, and sessions of traditional lecturing may be replaced by seminar discussions to facilitate the learning process. This should encourage the students to take responsibility for their own learning. The lecture material should also be peer reviewed and achieve a status comparable to journal articles.

On-campus courses and distant learning courses will be integrated even if the delivery may be shaped in different ways. Existing lecture courses should always be available on the Web. Existing knowledge and research results should also be available, and packed in a way tailored for use in different areas of professional practice. All graduates will then have access to the newest knowledge throughout their professional life.

5. FINAL REMARKS

Information and communication technologies are essential but the developments in this area are difficult to cope with in government, businesses, and at the universities. ICT developments provide huge opportunities but also threats in terms of demands for keeping up.

The three areas of e-Governance, Knowledge Management, and e-Learning are interdependent and constitute the key challenge of the future: "the e-Future Challenge". FIG should develop ways and means to face this challenge. The efforts of Commission 2, 3 and 7 in this area are very timely and most welcome.

REFERENCES

Enemark, S. and Sorensen, E. M.: *Learning Lab Geomatics – The Danish Approach to Virtual Academy.* Proceedings of Commission 2, the FIG Congress, Washington, April 2002,11 p.

Enemark, S.(2005): *Understanding the Land Management Paradigm.* Proceedings of FIG Commission 7 Symposium on Innovative Technologies for Land Administration, Madison, Wisconsin, USA, 24-25 June 2005, 13 p.
http://www.fig.net/council/enemark_papers/madison_2005.pdf

Enemark, S., Williamson, I., and Wallace, J.(2005): *Building Modern Land Administration Systems in Developed Economies.* Journal of Spatial Science, Perth, Australia, Vol. 50, No. 2, December 2005, pp 51-68.

Markus, B. (2005): *Learning Pyramids.* Proceedings of FIG Working Weeks, Cairo, Egypt, 16-21 April 2005.

Wallace, J., Williamson, I.; Enemark, S., (2006): *Building a National Vision for Soatially Enabled Land Administration in Australia.* In: Sustainability and Land Administration Systems. Proceedings of the Expert Group Meeting, Melbourne, Australia, 9-11 November 2005, pp 237- 250..

Williamson, I.; Enemark, S., Wallace, J. eds. (2006): *Sustainability and Land Administration Systems*. Proceedings of the Expert Group Meeting, Melbourne, 9-11 November 2005, 253 p.

BIOGRAPHICAL NOTES

Stig Enemark is Professor in Land Management and Problem Based Learning at Aalborg University, Denmark, where he was Head of the School of Surveying and Planning 1991-2005. He is Master of Science in Surveying, Planning and Land Management and he obtained his license for cadastral surveying in 1970. He worked for ten years as a consultant surveyor in private practice. He is President of the Danish Association of Chartered Surveyors (since 2003) and he is Vice-President of the International Federation of Surveyors (FIG) 2005-2008. He was Chairman of FIG Commission 2 (Professional Education) 1994-98, and he is an Honorary Member of FIG (since 1999). His teaching and research are concerned with land administration systems, land management and spatial planning, and related educational and capacity building activities. Another research area is within Problem Based Learning and the interaction between education, research and professional practice. He has undertaken consultancies for the World Bank and the European Union especially in Eastern Europe, Sub Saharan Africa, and Latin America. He has around 250 publications to his credit, and he has presented invited papers to more than 60 international conferences.

CONTACTS

Stig Enemark
Vice-President of FIG
Professor in Land Management
Aalborg University, 11 Fibigerstrede
9220 Aalborg, DENMARK
Tel. + 45 9635 8344, Fax: + 45 9815 6541
Email: enemark@land.aau.dk
Website: www.land.aau.dk/~enemark