

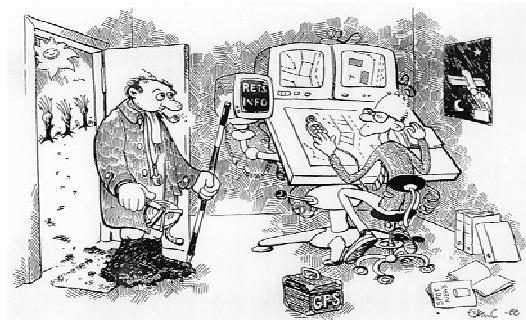


FIG-President Univ. Prof. Dr. Holger Magel

## “Shaping the Change: Visions on surveying and surveyors in a new century“

Lecture on 29<sup>th</sup> October 2003 at University of  
Technology in Kingston, Jamaica

## The Only Constant is Change



Source: Prof. Stig Enemark, Head of School of Surveying and Planning Aalborg University, Denmark, Intergeo, Hamburg, 12 September 2003

## Contents



1. The only Constant is Change
2. Shaping the Change: Impacts on Surveying and Surveyors
3. The Professional Challenges and FIG's Role
4. The Educational Challenges
5. Enhancing Professional Competence
6. Five Guiding Principles for Securing the Future of Surveying and Surveyors

“The overview of current surveyors activities and tasks is sufficient but the prospect of future is even more exciting with regard to the incoming variety and area of tasks and new chances. The ways of surveying will change. A lot of measurements will in future be carried out by machines or people with lower education. But at every time new methods and technologies must be developed, commanded and used ...

The education must consider and provide more theory and more general fundamentals ...”

Prof. Karl Rinner, Austria  
one of the last universal  
surveyors and geodesists  
on 8 Nov. 1968\* at  
University Bonn, Germany

\* K. Rinner: Stand und Ausblick in der geodätischen Forschung und Lehre. ZfV 1969/ Heft 6

## 1. The only Constant is Change



## The Global Drivers



- **Technology development**
  - GPS, GIS, Internet
- **Micro-economic reform**
  - privatisation, decentralisation, downsizing, quality assurance
- **Globalisation**
  - from local to global
  - events in one part of the world impact on people in other parts of the world
- **Sustainable development**
  - developments that effectively incorporates economic, social and environmental concerns in decision-making
  - meet the needs of the present without compromising the ability of future generations to meet their own needs

Source: Prof. Stig Enemark, Head of School of Surveying and Planning Aalborg University, Denmark, Intergeo, Hamburg, 12 September 2003

## The Professional Challenges



The spatial information revolution and the evolving land management paradigm in support of sustainable development have had many influences on education and professional structures over the last two decades. Professions such as surveying are being re-engineered and re-invented to accommodate the spatial information revolution, while endeavouring to maintain traditional services.

The international surveying profession and the national associations will have to adapt to these challenges and develop structures that accommodate a modern interdisciplinary profile. ...

Stig Enemark: Underpinning Sustainable Land Administration Systems  
16<sup>th</sup> UN Regional Cartographic Conference for Asia and the Pacific, Okinawa, Japan, 14 – 18 July 2003

## 2. Shaping the Change: Impacts on Surveying and Surveyors



### At the edge of the map



Source: Prof. Stig Enemark, Head of School of Surveying and Planning Aalborg University, Denmark, Intergeo, Hamburg, 12 September 2003

### “SHAPING THE CHANGE”: IMPACTS ON SURVEYING AND SURVEYORS



#### UN Millennium Development Goals, Rio, Istanbul and Johannesburg Declarations

Agenda 21, Secure Tenure, Access to Land, Gender Issue, Civil Society, Good Governance, Poverty Reduction

#### Globalisation - New Technologies – New Networks

UN- and FIG-topics: urban-rural interrelationships (for) sustainable development, Spatial Information Management, Land Management etc.

#### National politics and policy

main fields of challenges to surveyors		surveyors responses by
<b>Property</b> (classical survey activities)	Definition and Identification of physical, legal, economic rights and of their changes, land laws and policy, tenure systems, land reform, land market	land and resource management, land administration, spatial and land use planning, land registration and recording (cadastres), engineering survey, (mobile) GPS and GIS-technologies, 3-D measurements, LRS, SDI, NSDI (“digital earth”) photogrammetry, remote sensing, cartography, hydrography, satellite imaging systems and mobile mapping, measurement of gravity field, atmosphere and shape of earth, village, landscape and town planning, urban and rural land readjustment and land consolidation, land markets, land banking, land valuation, taxation, real estate management, construction economics and management, environmental impact assessment, construction procurement, cost and project management, disaster management, monitoring, public-private-partnership and entrepreneurship, participatory planning, conflict solution, education, capacity building.
<b>Land</b> incl. water (scarce common resource)	sustainability, natural environment and equity (land, water, marine, mineral resources, fauna, flora, aesthetical beauty), earth’s shape and atmosphere	
<b>Construction</b> (liveable and just world)	housing policy, sustainable human settlements, urban and rural development and infrastructure, economic, ecological and social growth	

FIG-Vision: Managing of

#### Conclusion:

FIG-Motto 2003 – 2006 “Shaping the Change”

“Shaping the change“ only possible by changing and broadening surveyors profession, activities and capacities

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### Facing the new world



Source: Prof. Stig Enemark, Head of School of Surveying and Planning Aalborg University, Denmark, Intergeo, Hamburg, 12 September 2003

### “SHAPING THE CHANGE”: IMPACTS ON SURVEYING AND SURVEYORS



#### UN Millennium Development Goals, Rio, Istanbul and Johannesburg Declarations

Agenda 21, Secure Tenure, Access to Land, Gender Issue, Civil Society,

Good Governance, Poverty Reduction

Globalisation - New Technologies – New Networks

UN- and FIG-topics: urban-rural interrelationships (for) sustainable development, Spatial Information Management, Land Management etc.

National politics and policy

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**“SHAPING THE CHANGE”:  
IMPACTS ON SURVEYING AND SURVEYORS**

**main fields of challenges to surveyors**

<b>Property</b> (classical survey activities)	≅	Definition and Identification of physical, legal, economic rights and of their changes, land laws and policy, tenure systems, land reform, land market
<b>Land incl. water</b> (≅ scarce common resource)	≅	sustainability, natural environment and entity (land, water, marine, mineral resources, fauna, flora, aesthetical beauty), earth's shape and atmosphere
<b>Construction</b> (liveable and just world)	≅	housing policy, sustainable human settlements, urban and rural development and infrastructure, economic, ecological and social growth

FIG-Vision: Managing of

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**Plan of Implementation**

36. ...

(g) Promote the systematic observation of the Earth's atmosphere, land and oceans by improving monitoring stations, increasing the use of satellites, and appropriate integration of these observations to produce high-quality data that could be disseminated for the use of all countries, in particular developing countries;

...

Source: Plan of Implementation, World Summit on Sustainable Development, September 2002

**“SHAPING THE CHANGE”:  
IMPACTS ON SURVEYING AND SURVEYORS**

**surveyors responses by**

land and resource management, land administration, spatial and land use planning, land registration and recording (cadastre), engineering survey, (mobile) GPS and GIS-technologies, 3-D measurements, LIS, SDI, NSDI (“digital earth”), photogrammetry, remote sensing, cartography, hydrography, satellite imaging systems and mobile mapping, measurement of gravity field, atmosphere and shape of earth, village, landscape and town planning, urban and rural land readjustment and land consolidation, land markets, land banking, land valuation, taxation, real estate management, construction economics and management, environmental impact assessment, construction procurement, cost and project management, disaster management, monitoring, public-private-partnership and entrepreneurship, participatory planning, conflict solution, education, capacity building,

FIG-Vision: Managing of  
Property  
Land  
Construction

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**Plan of Implementation**

36. ...

(h) Enhance the implementation of national, regional and international strategies to monitor the Earth's atmosphere, land and oceans including, as appropriate, strategies for integrated global observations, inter alia with the cooperation of relevant international organisations, especially the United Nations specialized agencies in cooperation with the UNFCCC;

...

Source: Plan of Implementation, World Summit on Sustainable Development, Johannesburg, September 2002

**Sustainability and the status of geomatics**

Since the Rio Conference in 1992, **sustainability has been the central principle of international development**. In August 2002 the World summit on sustainable Development (WSSD) was held in Johannesburg and **geomatics** was unconditionally recognised as a **significant part of the solution to making the world more sustainable**. In the final WSSD Plan for Implementation there are many references, which will need geomatics input, including need for:

- Land reform;
- Land management;
- Monitoring the environment;
- Planning for sustainable developments;

RICS Geomatics – research, March 2003, Page 5.

**Plan of Implementation**

104. Assist developing countries, through international cooperation, in enhancing their capacity in their efforts to address issues pertaining to environmental protection including in their formulation and implementation of policies for environmental management and protection, including through urgent actions at all levels to:

...

Source: Plan of Implementation, World Summit on Sustainable Development, Johannesburg, September 2002

## Plan of Implementation



104. ...

(a) Improve their use of science and technology for environmental monitoring, assessment models, accurate databases and **integrated information systems**;

...

Source: Plan of Implementation, World Summit on Sustainable Development, Johannesburg, September 2002

## Plan of Implementation



106. Use information and communication technologies, where appropriate, as tools to increase the frequency of communication and the sharing of experience and knowledge, and to improve the quality of and access to information and communications technology in all countries, building on the work facilitated by the United Nations Information and Communications Technology Task Force and the efforts of other relevant international and regional forums.

Source: Plan of Implementation, World Summit on Sustainable Development, Johannesburg, September 2002

## Plan of Implementation



104. ...

(b) Promote and, where appropriate, improve their use of satellite technologies for quality data collection, verification and updating, and further improvement of aerial and ground-based observations, in support of their efforts to collect quality, accurate, long-term, consistent and reliable data;

...

Source: Plan of Implementation, World Summit on Sustainable Development, Johannesburg, September 2002

## Plan of Implementation



119. septies Promote the development and wider use of earth observation technologies, including satellite remote sensing, global mapping and geographic information systems, to collect quality data on environmental impacts, land use and land-use changes, including through urgent actions at all levels to:

Source: Plan of Implementation, World Summit on Sustainable Development, Johannesburg, September 2002

## Plan of Implementation



105. Establish regular channels between policy makers and the scientific community for requesting and receiving science and technology advice for the implementation of **Agenda 21**, and create and strengthen networks for science and education for sustainable development, at all levels, with the aim of sharing knowledge, experience and best practices and building scientific capacities, particularly in developing countries.

Source: Plan of Implementation, World Summit on Sustainable Development, Johannesburg, September 2002

## Plan of Implementation



119.septies ...

(a) Strengthen cooperation and coordination among global observing systems and research programmes for integrated global observations, taking into account the need for building capacity and sharing of data from ground-based observations, satellite remote sensing and other sources among all countries;

...

Source: Plan of Implementation, World Summit on Sustainable Development, Johannesburg, September 2002

## Plan of Implementation



38. ...

(b) Develop and implement integrated **land management and water-use plans** that are based on sustainable use of renewable resources and on integrated assessments of socio-economic and environmental potentials, and strengthen the capacity of Governments, local authorities and communities to monitor and manage the quantity and quality of land and water resources;

...

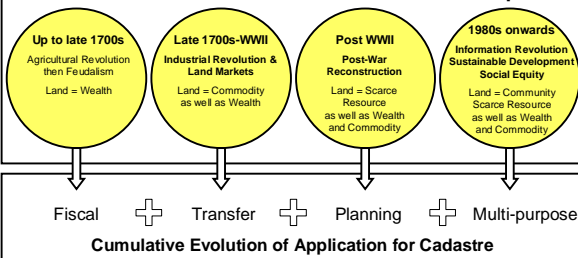
Source: Plan of Implementation, World Summit on Sustainable Development, Johannesburg, September 2002

## The Land-Issue in urban and rural areas is in the spotlight of the international and national Community



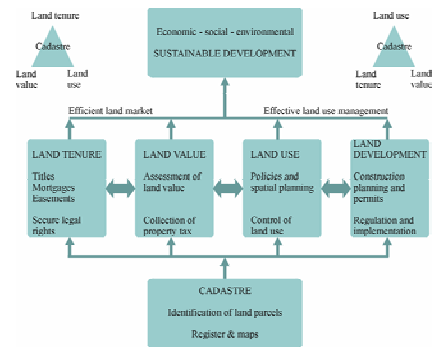
- UN Habitat Global Campaign for secure tenure, urban-rural interface, urban governance etc.
- World Bank: Land policy research report
- Hernando de Soto: "The mystery of capital"
- Land reform, Land redistribution, sound cadastre and registration systems etc. in Europe, Asia, Africa, America as precondition for economic growth
- UN-FIG-Conferences (Bogor, Bathurst, Nairobi, Marrakech)

## Main Phases in Humankind/Land Relationship



Trends in Geomatics - Technical University of Munich - Ian Williamson 2000

## A Global Land Administration Perspective



Source: Prof. Stig Eneemark, Head of School of Surveying and Planning Aalborg University, Denmark, Intergeo, Hamburg, 12 September 2003

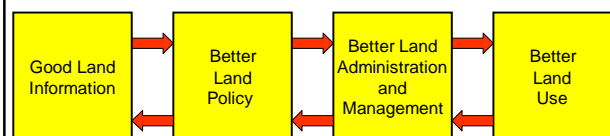
## The special thing Land ...



This fact makes it impossible to leave its use to be determined by the obscure interplay of market forces and the whim of the individual. An equitable legal and social system calls instead for the public interest to play a much stronger role in the case of land than in the case of other property assets. **That is why land cannot be treated as moveable goods in legal relationships.**

Source: German Federal Constitutional Court, 1967

Sustainable development is not attainable without sound Land administration



The Bathurst Declaration on Land Administration for Sustainable Development, FIG Publication No 21, 1999

## The Institutional Challenges



Establishing appropriate institutional and organisational infrastructures is seen as a crucial key for achieving sustainability in any society. In a theoretical sense, the concept of **property rights** is such an institution. **Appropriate cadastral systems** play a most important role in terms of facilitating the real property transactions such as land transfers, land taxation and control of land use and land development.

Stig Enemark: Underpinning Sustainable Land Administration Systems  
16<sup>th</sup> UN Regional Cartographic Conference for Asia and the Pacific, Okinawa, Japan, 14 – 18 July 2003

## Who needs access to coordinated geographic information?

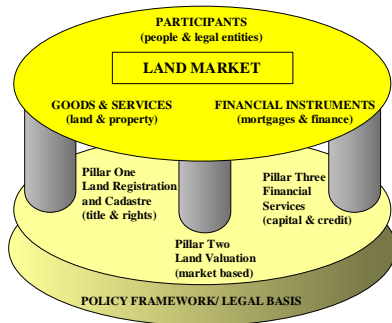


- Land Records Adjudication
- Disaster Response
- Transportation Management
- Water, gas & electric planning
- Public Protection
- Defense
- Natural Resource Management
- Telecommunications Infrastructure
- Economic Development



Otonchilo, W. K.: Spatial Data Infrastructure: Concepts and Components.  
URL: <http://kism.icconnect.co.ke/JICAWorkshop/pdf/Otonchilo.pdf>, 06.10.2003

## The Three Pillar Model



Source: Dale, Peter: The Importance of Land Administration in the Development of Land Markets - A global perspective  
Proceedings of UDMS 2000, 11.-15. September 2000, Delft, Netherlands

The modern **land administration system** is concerned with detailed information at the individual land parcel level. As such it should service the needs of both the individual and the community at large. Benefits arise through its application to e.g.:

- guarantee of ownership and security of tenure and credit;
- facilitate efficient land transfers and land markets;
- support management of assets;
- and provide basics information in processes of physical planning, land development and environmental control.

The system, this way, acts as a kind of backbone in society.

Stig Enemark: Underpinning Sustainable Land Administration Systems  
16<sup>th</sup> UN Regional Cartographic Conference for Asia and the Pacific, Okinawa, Japan, 14 – 18 July 2003

## Quotation from FIG Agenda 21 Chapter 6



Good decisions for Sustainable Development depend on access to reliable and relevant information and to a very large extent on information that is geographically referenced. The need for geographic information arises at all levels of government, from senior decision-makers to the grass roots and individual levels.

Considerable data exist, but access to data is often hampered by lack of standardisation, coherence and adequate services for data retrieval, including information about what data exist and where data are kept.

...

FIG Agenda 21, FIG Publication No 23, 2001

## The Nairobi Statement on spatial Information for Sustainable Development: Executive Summary



The objectives of the Nairobi Conference on Spatial Information for Sustainable Development /10/ were to:

- Contribute to the international community's effort to advance the implementation of UN Agenda 21 ([www.un.org/esa/sustdev](http://www.un.org/esa/sustdev)) and the Habitat Agenda ([www.unhabitat.org](http://www.unhabitat.org));
- Understand the role of the surveying community in implementing the Habitat Agenda;
- Urge governments and stakeholders to implement integrated land information-management;
- Strengthen and promote the relevant information to support FIG Agenda 21.

...

The Nairobi Statement on spatial Information for Sustainable Development, FIG Publication No 30, 2002

## Spatial Data and Spatial Information



Within FIG normally the term Spatial Data is used for „georeferenced data“. Combining data creates information. Spatial Information is information with a reference to a specific location (coordinate, an address, a property number, a cadastral number etc.)

The Nairobi Statement on spatial Information for Sustainable Development. FIG Publication No 30, 2002

## Land Information Management



City Governments currently manage considerable collections of land related information. However, the traditional separation of this information into different component themes, combined with disjoint information management regimes, leads to a considerable loss in value of the information as a resource. Comprehensive and City-wide Land Information Management (LIM) provides the means to technically and institutionally integrate these component themes of land information into a truly corporate information resource (FIG/UN-HABITAT, 2002). Figure below illustrates how this concept can add value by combining information concerning use, condition, value, and tenure of land and disseminating this to the decision makers.

Stig Eneemark: Underpinning Sustainable Land Administration Systems  
16<sup>th</sup> UN Regional Cartographic Conference for Asia and the Pacific, Okinawa, Japan, 14 – 18 July 2003

## Spatial Data and Spatial Information



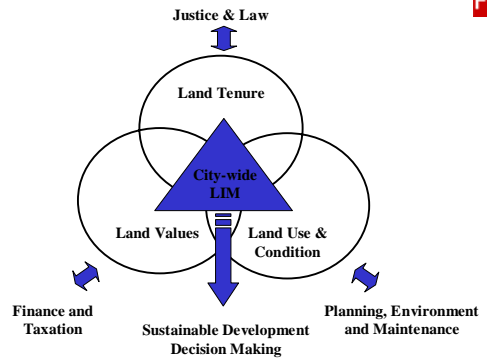
Management of Spatial Data and Information is a key element in the processes which leads to users of Spatial Information having a better overview of both simple and complex problems and which give users the possibility to create comprehensible and thus acceptable solutions and/or compromises.

Spatial Information Management is also about human resources and organisational changes. Being involved in Spatial Information Management means to be in the focal-point between man and technology.

Spatial Information Management as well as Spatial Knowledge Management is a growth field for surveyors.

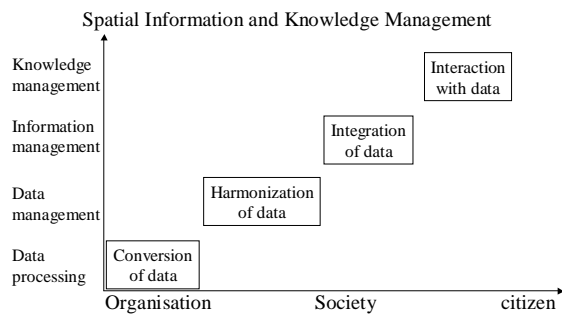
The Nairobi Statement on spatial Information for Sustainable Development. FIG Publication No 30, 2002

## Land Information Management



Land Information Management for Sustainable Development of Cities. Best Practice Guidelines in City-wide Land Information Management. FIG Publication No 31, 2002

## Spatial Data Infrastructure



The Nairobi Statement on spatial Information for Sustainable Development. FIG Publication No 30, 2002

## “SHAPING THE CHANGE”: IMPACTS ON SURVEYING AND SURVEYORS



### surveyors responses by

land and resource management, land administration, spatial and land use planning, land registration and recording (cadastre), engineering survey, (mobile) GPS and GIS-technologies, 3-D measurements, LIS, SDI, NSDI (“digital earth”), photogrammetry, remote sensing, cartography, hydrography, satellite imaging systems and mobile mapping, measurement of gravity field, atmosphere and shape of earth, village, landscape and town planning, urban and rural land readjustment and land consolidation, land markets, land banking, land valuation, taxation, real estate management, construction economics and management, environmental impact assessment, construction procurement, cost and project management, disaster management, monitoring, public-private-partnership and entrepreneurship, participatory planning, conflict solution, education, capacity building,

**FIG-Vision:  
Managing of  
Property  
Land  
Construction**

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### 3. The Professional Challenges and FIG's Role



### 4. The Educational Challenges

#### The Professional Challenges



The spatial information revolution and the evolving land management paradigm in support of sustainable development have had many influences on education and professional structures over the last two decades. Professions such as surveying are being re-engineered and re-invented to accommodate the spatial information revolution, while endeavouring to maintain traditional services.

The international surveying profession and the national associations will have to adapt to these challenges and develop structures that accommodate a modern interdisciplinary profile. **This includes adoption of ethical principles and model codes of professional conduct suitable for performing this modern role.**

**The profile of the surveying profession in the third millennium will include a mix of technical surveying and mapping professionals, business practitioners, spatial data managers, land and environmental resource managers (in public as well as private sector), and legal and financial consultants on land management matters.**

Stig Eneemark: Underpinning Sustainable Land Administration Systems  
16<sup>th</sup> UN Regional Cartographic Conference for Asia and the Pacific, Okinawa, Japan, 14 – 18 July 2003

#### The Educational Challenges



Traditional education of surveyors has focused on geometry and technology more than on land use and land administration. Taking a land administration approach to surveying education, there is a need to change the focus from being seen very much as an engineering discipline. There is a need for a more managerial and interdisciplinary focus as a basis for developing and running adequate systems of land administration.

A future educational profile for land administrators should be composed by the areas of Measurement Science and Land Administration and supported by and embedding in a broad interdisciplinary paradigm of Geographic Information Management. Such a profile is illustrated below.

Stig Eneemark: Underpinning Sustainable Land Administration Systems  
16<sup>th</sup> UN Regional Cartographic Conference for Asia and the Pacific, Okinawa, Japan, 14 – 18 July 2003

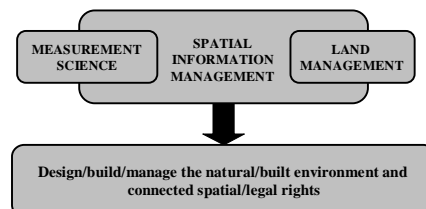
#### FIG Commissions



- Commission 1 – Professional Standards & Practice
- Commission 2 – Professional Education
- Commission 3 – Spatial Information Management
- Commission 4 – Hydrography
- Commission 5 – Positioning and Measurement
- Commission 6 – Engineering Surveys
- Commission 7 – Cadastre & Land Management
- Commission 8 – Spatial Planning & Development
- Commission 9 – Valuation and the Management of Real Estate
- Commission 10 - Construction Economics and Management

The very latest challenge:  
Partner for UNEP in the field of „disaster and risk management“

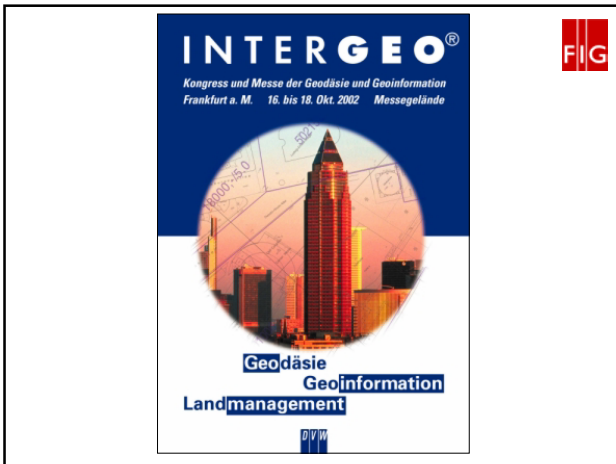
#### The Educational Challenges



THE EDUCATIONAL PROFILE OF THE FUTURE

Stig Eneemark: Underpinning Sustainable Land Administration Systems  
16<sup>th</sup> UN Regional Cartographic Conference for Asia and the Pacific, Okinawa, Japan, 14 – 18 July 2003





## ...International Trends in Surveying Education



- **Virtual Academy** - versus classroom lecture courses
  - from traditional on-campus activities
  - to a more open role of serving the profession and the society
- **Lifelong Learning** - versus vocational training
  - from learning for life through university graduation
  - to lifelong learning through CPD-strategies and distance learning

Source: Prof. Stig Enemark, Head of School of Surveying and Planning Aalborg University, Denmark, Intergeo, Hamburg, 12 September 2003

## Learning to Learn



Professional and technical skills can be acquired and updated later in ones carrier, while skills for problem solving and skills for learning to learn can only be established through the process of academic training at the universities.

Source: Prof. Stig Enemark, Head of School of Surveying and Planning Aalborg University, Denmark, Intergeo, Hamburg, 12 September 2003

## Demands of German employers on graduates



### Professional Skills

- well-grounded education
- efficient studies (but not in record time and not only-studies)
- good final degree

Source: Institut für Bildungs- und Wissenschaftsdienste: Ein Wegweiser für den erfolgreichen Einstieg in den Beruf, Guide für die Hochschulregion Bayern, 2003

## International Trends in Surveying Education...



- **Management Skills** - versus specialist skills
  - from traditional technical skills and push button technologies
  - to interpretation and management of data meeting the needs of the clients
- **Project Organised Education** - versus subject based
  - from traditional technical skills (knowing how) add-on approach
  - to management and problem solving skills (knowing why) focus on "learning to learn"

Source: Prof. Stig Enemark, Head of School of Surveying and Planning Aalborg University, Denmark, Intergeo, Hamburg, 12 September 2003

## Demands of German employers on graduates



### Additional Skills

- foreign language skills (English and an another one)
- practical knowledge or previous vocational training
- activities in addition to the studies (social engagement, member of a orchestra etc.)
- studies abroad or an additional final degree of a foreign university
- knowledge of modern ICT
- good general education
- to be sovereign in superior spoken and written style

Source: Institut für Bildungs- und Wissenschaftsdienste: Ein Wegweiser für den erfolgreichen Einstieg in den Beruf, Guide für die Hochschulregion Bayern, 2003

## Demands of German employers on graduates

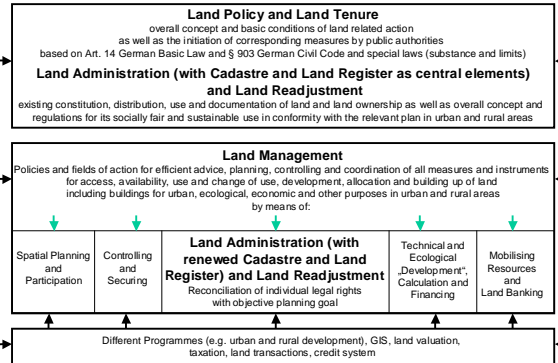


### Key Qualifications (Soft Skills)

- diligence, determined action and staying power
- mental flexibility
- thinking in context
- results-oriented working
- knowledge of human nature, soft skills and managerial skills
- authority with convincingly arguments
- ability to team-work
- to approach problems by different ways
- close to reality
- fantasy and creativity
- and last but not least willingness for lifelong learning

Source: Institut für Bildungs- und Wissenschaftsdienste: Ein Wegweiser für den erfolgreichen Einstieg in den Beruf, Guide für die Hochschulreglung Bayern, 2003

## Relationships between Land Policy, Land Tenure and Land Management in Germany



H. Magel, based on model by Professor Theo Kötter, Hanover University at the 3rd Munich Congress of Land Readjustment and Land Development 2001

## Profile of Surveyors/Geodesists Education at Technical University of Munich (TUM)



- Preparation for activities in research and practice with the wide range „from the single parcel to the planet mars“
- Comprehensive scientific education in the fields of Geodesy, Geoinformation and Land Management
- The Graduates finally should have become a “wellgrounded specialized Generalist”, based on ethical values and a commitment to society.

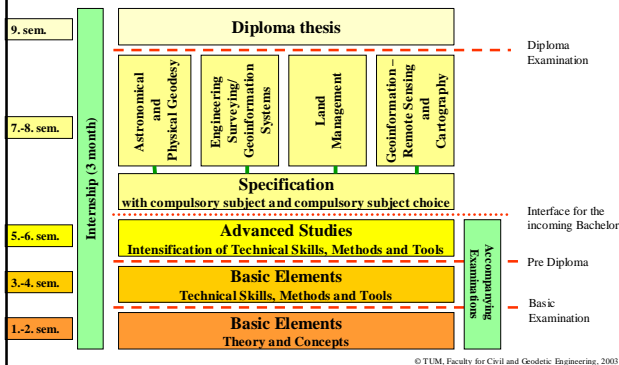
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**Land policy** is regarded in accordance with an Advisory Opinion of the Federal Constitutional Court in 1954 as a part of regional planning. It comprises the totality of the activities of public authorities in relation to land.

**Land policy** is understood as conscious action to bring about an optimal use of land as well as of a socially just distribution of landownership and of income from land.

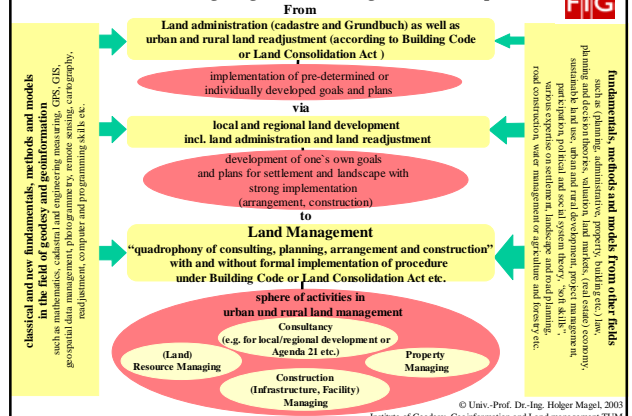
Source: Federal Constitutional Court, Baugutachten, 1954

## New Structure of the Curriculum for TUM-Geodesy and Geoinformation



© TUM, Faculty for Civil and Geodesic Engineering, 2005

## LAND MANAGEMENT IN GERMANY The new challenge to geodetic teaching, research and practice



© Univ.-Prof. Dr.-Ing. Holger Magel, 2003  
Institute of Geodesy, Geoinformation and Land Management, TUM

## 5. Enhancing Professional Competence



**Deadline for Application**

Deadline for the academic year starting each year in October/May 31<sup>st</sup> of the same year.

Deadline for DAAD-Scholarship October 15<sup>th</sup> of the previous year.

Application forms and further information about the Master's Program are available from:

Univ.-Prof. Dr.-Ing. Holger Magel  
Chair of Land Readjustment and Land Development,  
FIG-President 2003 – 2006 Program Director  
Dipl.-Geogr. M.A. Babette Wehmann  
Program Manager

Technische Universität München  
Institut für Geodäsie, GIS und Landmanagement  
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Fax: +49-89-289 23033  
Email: master@landerwicklung-muenchen.de

[www.landmanagement-master.de](http://www.landmanagement-master.de)

The Master's Program "Land Management and Land Tenure" is supported by:

**gtz**  
Deutscher Akademischer Austausch Dienst  
German Academic Exchange Service

**TECHNISCHE UNIVERSITÄT MÜNCHEN**

**Master of Science (MSc) in Land Management and Land Tenure**

Faculty of Civil Engineering and Geodesy

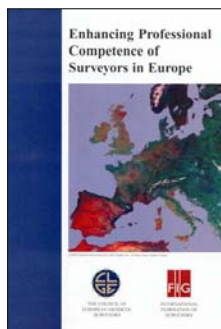
Institute of Geodesy, GIS and Land Management

Germany

Application

International Graduate Program

## Enhancing Professional Competence



[www.fig.net](http://www.fig.net)



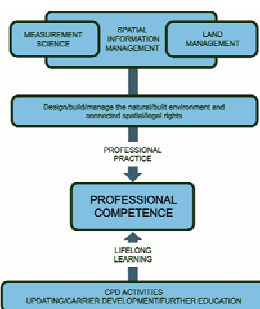
MASTER OF SCIENCE  
in  
Land Management and Land Tenure



### Philosophy of the Program

To demonstrate and illustrate the important role of land rights and land policy, land management and land administration for a sustainable urban and rural development in the broader context of good governance and to teach adequate approaches and tools for their implementation.

## ... A Lifelong Learning Perspective



**THE PROFESSIONAL COMPETENCE MODEL**

Source: Prof. Stig Enemark, Head of School of Surveying and Planning Aalborg University, Denmark, Intergeo, Hamburg, 12 September 2003



MASTER OF SCIENCE  
in  
Land Management and Land Tenure



### List of Courses

#### Basic Elements

- Global Framework for Land Management and Land Tenure
- Rural and Urban Development
- Land Rights and Land Tenure Systems
- Land Policy
- Land Economics (Land Valuation, Land Markets, Land Taxation)
- Land Management
- Land Administration
- Natural Resource Management
- Land Management and Land Tenure in Germany



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### List of Courses

#### Methods and Tools

- Participatory Planning
- Conflict Management and Reconciliation of Land Conflicts
- Photogrammetry and Remote Sensing
- Visualisation of Geodata, (Internet-) Cartography, GIS and GPS
- Project Planning and Impact Monitoring
  
- Management Skills
- Study Skills
- Research Skills



### 6. Five Guiding Principles for Securing the Future of Surveying and Surveyors



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### Structure of the Program

Summer	1. Term	2. Term	3. Term
Preparation	Basic Elements (Theory and Concepts)	Methods and Tools	Thesis
<ul style="list-style-type: none"> <li>• German Language Course</li> <li>• Orientation Month</li> </ul>	<ul style="list-style-type: none"> <li>• Classes</li> <li>• Accompanying Examinations</li> <li>• Preparation for Internship</li> </ul> <p style="text-align: center; background-color: #005596; color: white; padding: 2px;">Internship in Germany or Abroad</p>	<ul style="list-style-type: none"> <li>• Wrap up</li> <li>• Classes</li> <li>• Accompanying Examinations</li> <li>• Preparation for Internship</li> </ul> <p style="text-align: center; background-color: #005596; color: white; padding: 2px;">Research Project/ Thesis Abroad</p>	<ul style="list-style-type: none"> <li>• Wrap up</li> <li>• Thesis</li> </ul>



### Five Guiding Principles for Securing the Future of Surveying and Surveyors in the point of view of a World Bank Manager

1. Strengthening of self confidence. Surveyors are the obstetrician of geodetic referenced data and points!
2. Better information policy, public relations and marketing strategy. Especially the political decision makers must be contacted and informed about the needs and benefits of surveyors work like Geoinformation systems.
3. Extension of surveyors networking by a rich variety of partnerships
4. Smooth start of international activities backed by the public authorities
5. Broadening of the range of activities with new strategies, products, services and business plans; excellent education; use of modern technologies and finally: **Be courageous and open to the change and the future**

Prof. Reinhold Wessely, World Bank  
on 8 April 2003 at 8<sup>th</sup> Austrian Geodetic Days in Wels/Austria



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### What do we want to achieve?

#### Our graduates will be qualified to work with:

- local and national government
- local and national administration
- private sector
- non-governmental organisations

#### Our graduates will be in a position to:

Manage, administer, organize, moderate, facilitate, develop technical solutions and provide scientific analysis



The International Federation of Surveyors and its current council and commissions are strongly underlining these afore mentioned Guiding principles. The principles are an integrated part of FIG's philosophy, strategy and work plans. All surveyors and surveyor associations of the world, either practitioners, business men or academics, can therefore trust in, that their global organisation FIG is a reliable and very competent partner in shaping and thus securing the future of surveying and surveyors.

FIG President Prof. Mage1 on occasion  
of his visit of Jamaica, Oct. 2003