



"From the wisdom of the ages  
to the challenges of modern world"



# FIG WORKING WEEK 2015

## 17-21 MAY SOFIA BULGARIA

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### *The Future of Surveying*



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FIG has always acknowledged "change" as a reality of our world:

**"Timing" is introduced  
as the crucial factor in  
our theme**

- ❑ In 1938: *the role of the surveyor in the social order of today.*
- ❑ 1990s: *information society; globalization; shaping the change; facing the challenges, engaging the challenges.*
- ❑ 2015: *respond to change; respond intelligently.*



Photo by P. Laarakker FIG WW Abuja 2013



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## Investigate the Change

Geospatial information is recognized as the tool to address issues like :

- ❑ Population growth
- ❑ Rapid urbanization
- ❑ Tendency of development to cluster within the coastal zones
- ❑ Rapid response to natural disasters
- ❑ Interconnectivity



Photo: Kathmandu Living Labs



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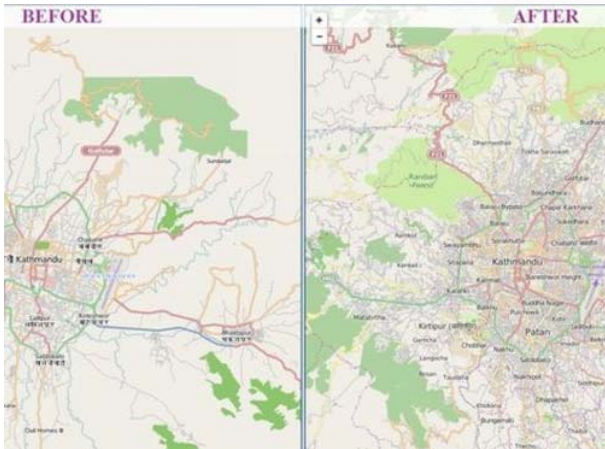




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## Nepal



Nama Raj Budhathoki who received a Ph.D. in crowdsourcing, open data and social and mobile media at the University of Illinois, had created a detailed map of Kathmandu using OSM before the earthquake hit.



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## Changing economies, markets & societal needs: **security of tenure**

- ❑ The empowerment of *private property rights*
- ❑ Implementation of these rights
- ❑ Registration of property rights
  - ❑ *Provide secure ownership to land and real property, and*
  - ❑ *Support the operations of the property market*

Photo: GLTN



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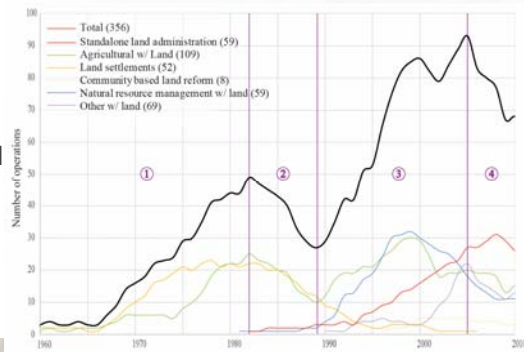


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## The World Bank land tenure projects

- The WB has financed land tenure projects for more than half a century
- More than US\$3.1 billion in total
- The ECA land reform US\$ 1.1 billion
- Land given at *low cost* or *free*



Source: The World Bank



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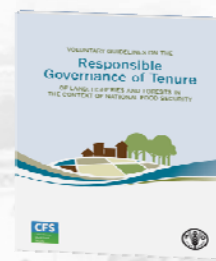


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## The VG on The Responsible Governance of Tenure (VGGT)

- FAO gave *strategic priority to the security of tenure*
- The implementation phase had two pillars:
  - Raising awareness through 10 regional conferences
  - Organizing national workshops to provide concrete proposals



Source: FAO



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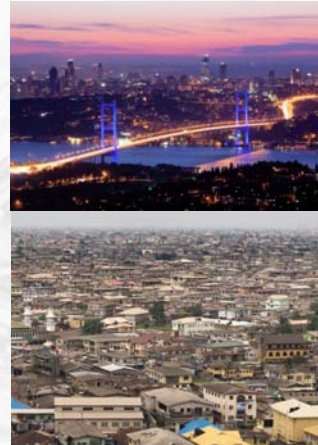


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## Urbanization is a major global change

- Concentration often produces *economies of scale* and leads to social and economic benefits
- It is also a matter of human rights that *people are free to choose* where they will live and work
- Population growth at a rate of **5 million** every month
- *Limited capacity* of authorities to provide **affordable urban land & affordable housing**



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## A growing global housing gap

- Unplanned areas with disaster risks; *low-paying* job opportunities.
- Management needs *technical skill* but also *expertise* in social, economic and environmental aspects.
- Many existing tools *are not efficient* in providing pragmatic land use planning solutions



Source: UN-HABITAT



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## Lack of affordable housing is a reality even in the developed world

- ❑ *Shrinkage of labor force*
- ❑ No business investment where no affordable housing for workers
- ❑ Job location vs distant housing
- ❑ A disappearing *middle class*?
- ❑ Social problems due to lack of quality affordable housing



Source: Joint Center for  
Housing Studies of  
Harvard University



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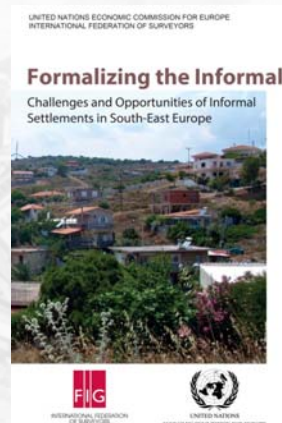


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## Formalizing the Informal

- ❑ Many in the UNECE region live in informal settlements
- ❑ housing is not only a shelter but a *tool to create wealth*
- ❑ Unclear property rights & use regulations cause "*uncertainty*", "*economic exclusion*" and "*social unrest*"



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## The role of private sector

- A country's housing policy is connected to its basic infrastructure; development policy; its general land policy
- A need for *increased public funds*
- A need for *private sector participation*
- The *role of the state*: from *provider* of growth to an *enabler* of growth



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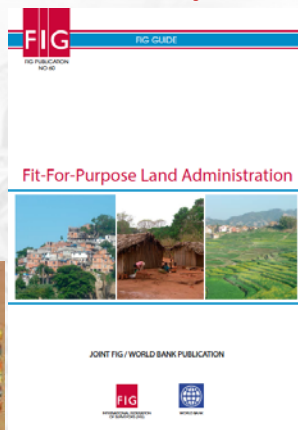


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## Fit-For-Purpose approaches: *the role of Surveyors*

- *Value of cadastre for a national economy*
- Most developing countries have less than 30% cadastral coverage
- Innovative, fit-for-purpose universal parcel recordation



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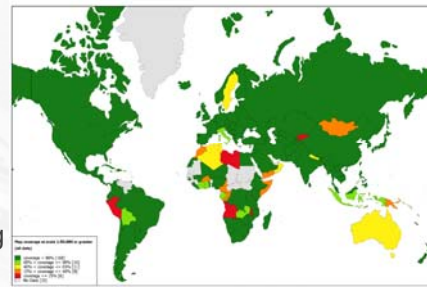


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## Changing Technology supports mapping

- Improvement in information technology:  
digital electronics; *big data*  
*management & distribution*.
- 1986: the average age of maps varied  
from 20 to 50 years.  
33.5% of the world at 1:25,000  
65.6% at a scale of 1:50,000
- 2012: globally the availability of mapping  
at 1:50,000 is high
- A remaining global need for large scale  
mapping



(source: Konecny, 2015)



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## Fast Large-Scale Mapping

- The current rise of UAVs with cameras and laser  
scanners
- Developments in point cloud processing
- High resolution orthophotos and 2D site maps; 3D  
maps that can be navigated online; 2D and 3D  
measurements; change detection.



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## Changing Technology

- Technical developments also include *airborne Lidar*
- Advanced *aerial multi-camera*
- *Dense image matching*
- *Modernization of software* to be more 'app-like'
- *Interconnectivity* (total stations, GNSS, mobile devices, etc)

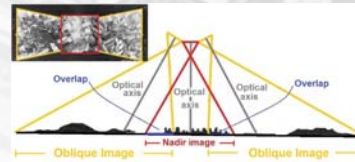


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## Changing Culture-open data

- Interconnectivity creates new **security concerns**, but it offers **huge benefits**.
- The innovative process of **crowdsourcing**
- Tendency towards **more open data**
- A need for **national information strategies**



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## Changing culture-authoritative data free of charge

- There is a *changing culture for web-based authoritative spatial information*
- how much* of that can governments *afford*?
- Authoritative data can be provided and assured by government agencies but also by crowdsourcing but always *with the engagement of surveyors*



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## Spatial Information in city management

- Technology transforming cities into *smart cities*
- Cities will be connected and will interact with people freely
- A *smart city* is a developed urban area that creates sustainable economic development and high quality of life by excelling in multiple key areas: economy, mobility, environment, people, living, and government



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## Surveyors in city management

- Professionals in geoinformatics are expected to develop expertise and capacity building in reliable and reusable information provision.
  - DSMs
  - GIS
  - UAV apps
  - mobile mapping services
  - 3d/4d city models
  - smart "apps"
  - Building Information Modeling (BIM)
  - measurement standards
  - installation of sensors in smart buildings
  - the Internet of Things
  - using sensors in web 2.0
  - mobile social sensing



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## Surveyors in city management

- Global construction volume is expected to be US\$12 trillion by 2020.
- BIM in activities such as cost planning and budget estimating, value management, risk management and calculation, bid documentation, commercial management and contract administration, dispute resolution, etc
- BIM enhances team collaboration and understanding among various professionals as well as better information management, reduction of errors and time requirements.
- *Combining BIM with Land Administration*

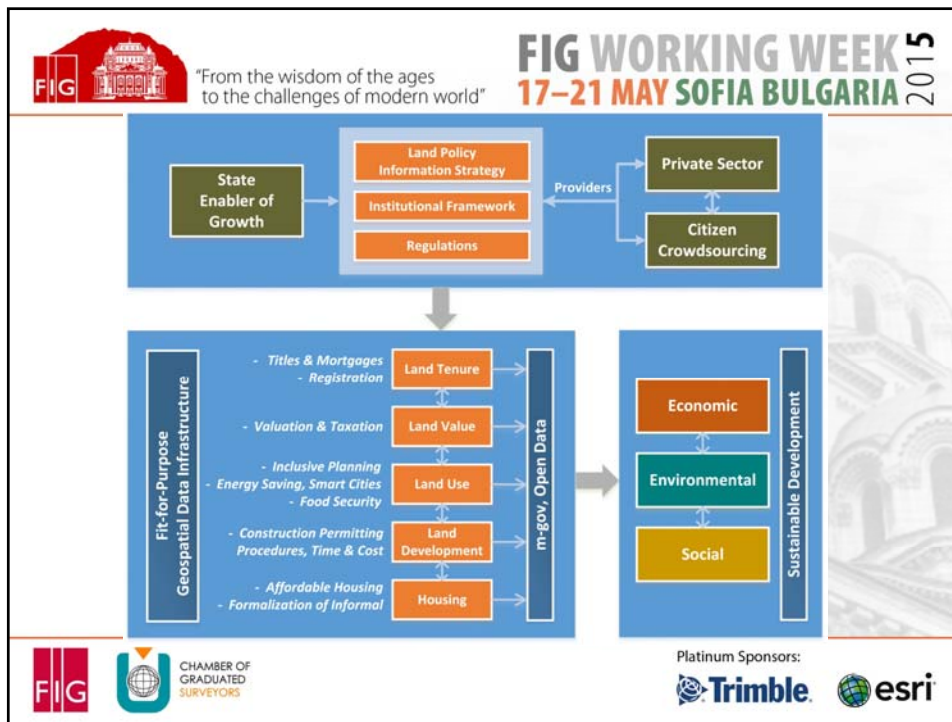


Source: SeeLian Ong



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## The response

- In the urbanization and globalization era, a **globalization of science** is taking place
- As competition increases surveyors must maintain high **technical education** & in-depth **technical research**, & should be prepared to cope with large amounts of **spatial information**
- Cooperation with other professionals; **solution functionality, reliability, affordability**
- The relationship between **quality and cost**

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## Our Vision

- It is urgent that the surveying profession will *think ahead*, predict future changes, *foresee the requirements of the next generation of the public and structure the way ahead*
- It is the purpose of FIG to lead "*global*" surveyors capable to contribute to an ambitious *post-2015 global sustainable development agenda*
- During the 2015-2018 time period FIG, its council and commissions, member associations, academic members, YSs, CDN, affiliate and corporate members will strive to achieve the FIG Vision *to contribute to the post 2015 global sustainable development agenda*



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## We all thank You



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