

## **Commission 7 – Cadastre and Land Administration Report 2015**

### **General Remarks**

The Mission of Commission 7 is:

- to provide a global forum for enhancing and exchanging knowledge about cadastre, land administration and land management
- to encourage the development of pro-poor land management and land administration tools
- to promote the importance of sustainable land administration infrastructures as being essential for sustainable development and economic growth
- to underpin the use of innovative and advanced technology in cadastre and land administration;
- to raise awareness of the role of surveyors in land administration matters to the public and among stakeholders.

Commission 7 builds upon a long term expertise from national delegates, experts and partners with different professional background. Based on results from previous years, Commission 7 has provided assistance and knowledge for the implementation of the overall FIG strategy as far as related to cadastre and land management.

There is a focus on

- providing visions for future cadastre and land management
- taking the role as a mastermind in developing effective land management
- thinking about new models of land administration for sustainable development
- initiating professional discussions on new business models as required by a changing society
- securing land tenure and advocating citizens' rights

but at the same time, Commission 7 aims at staying pragmatic about what is feasible in a surrounding of cultural and social diversity and how commitment among stakeholders can be created for the benefit of the society and for the reputation of the profession in providing sustainability and advocacy to citizens, land owners and stakeholders.

Besides organizing or co-organizing events within the scope of Commission 7, representatives of the Commission take part in a considerable number of events all over the world.

Events which have been attended during the past year by the Chair G. Schennach

- 2<sup>nd</sup> Session of the Preparatory Committee for UN Conference on Housing and Sustainable Urban Development (HABITAT III) (PREPCOM2) and meeting with representatives of FAO in Nairobi, April 2015 together with FIG President Ch. Potsiou
- VIII Regional Conference on Cadastre and Spatial Data Infrastructure, Pristina/Kosovo, June 2015 with keynote by Chair G. Schennach on Cadastre – a Service for Society
- Meeting with the Portuguese Ordre of Surveyors on professional issues for the implementation of the cadastre, Lisbon and Coimbra/Portugal, June 2015.

Consultations about international seminar on Cadastre 4.0 in autumn 2016 and on FIG Commission 7 Annual Meeting 2016.

- Annual Conference of the Permanent Committee of Cadastre in Iberoamerica (CPCI) and 8<sup>th</sup> international Symposium on Cadastre, August 2015, Brasilia/Brasil with keynote on how progress in modern cadastre is challenging existing models and paradigms. Consultations with high-level representatives of several Iberoamerican cadastre authorities about future involvement into FIG and FIG Commission 7 activities.
- 7<sup>th</sup> Congress of the Moroccan National Ordre of Surveyors and Topographic Engineers (ONIGT) and Internat. Forum of Experts on Land Policy, Rabat/Morocco, Oct 2015 with keynote by Chair G. Schennach on "Changing Paradigms in Setting up Sustainable Cadastral Systems" and consultations about closer collaboration with FIG Commission 7.
- Co-operation with Commission 2 and local organisers for the Joint Commission 2/ISPRS/Commission 7 Workshop on the Role of Land Professionals and SDI in Disaster Risk Reduction in Kathmandu/Nepal, Nov 2016.
- Annual Meeting 2015 and the Joint Commission 3/Commission 7 International Workshop on Crowdsourcing of Land Information in Malta, Nov 2015.
- General Assembly of the Council of European Geodetic Surveyors CLGE, Tirana, Albania, March 2016 with a keynote by Commission 7 Chair G. Schennach on "The Profession between Cadastre and Citizen". Discussion of further co-operation between FIG Commission 7 and CLGE on the role of the surveyor in modern land administration systems.

## **Working Group 7.1 – Fit-For-Purpose Land Administration**

Chair: Dr. Ir. Christiaan Lemmen, The Netherlands, email: [Chrit.Lemmen@kadaster.nl](mailto:Chrit.Lemmen@kadaster.nl)

### **Policy Issues**

- identify role of Fit-For-Purpose Land Administration in relation to sustainable land use, food security, climate change etc. in the post-2015 Development Agenda
- implementing the 'Continuum of Land Rights' and the STDM into operation at country level including innovative methodologies for fast and low cost recording of land rights and appropriate land rights for future housing, including proposals for innovative land rights (new models of leasehold, tenure of public land etc.)
- identify the value of land consolidation and land readjustment for rural and urban areas in poverty prevention programmes
- develop the second edition of the Land Administration Domain Model with ISO on behalf of FIG by integrating partners from local-national, regional and international organisations, NGOs, NPOs, insurances, re-insurances, bank companies, bar associations
- promoting the development of innovative hard- and software solutions for land administration
- identify the needs for further development, quality improvement and system optimisation after Fit-For-Purpose Land Administration is implemented

### **Achievements 2015**

Presentations on Fit-For-Purpose Land Administration (incl. implementation of the continuum of land rights approach from GLTN/UN Habitat) have been given during the following events:

- World Bank Conference on Land and Poverty 2015, Washington DC, US, March 2015

- FIG Working Week, Sofia, Bulgaria, May 2015
- Landac Conference, Utrecht The Netherlands, July 2015
- Partners meeting of the Global Land Tool Network, Nairobi, Kenya, October 2015
- FIG Commission 7 Annual Meeting and FIG Joint Commissions 3 and 7 International Workshop Crowdsourcing of Land Administration, Malta, November 2015.

A special section on the Land Administration Domain Model was published in Land Use Policy, Volume 49, December 2015, pp. 527-689. Land Use Policy is an international and interdisciplinary journal concerned with the social, economic, political, legal, physical and planning aspects of urban and rural land use. The special section in December 2015 was guest edited by Prof Peter van Oosterom and Christiaan Lemmen and contains 16 articles.

### **Conferences/Seminars/Workshops**

World Bank Land and Poverty Conference, Washington/US, March 2016. An event, co-organised by World Bank, GLTN, FIG and the OGC on Building Infrastructure and Services for Imagery Based Land Administration discussed the requirements and the options for business models and provides an insight to the topic for industry. Presentation of ‘Fit For Purpose guidelines’ by Prof Stig Enemark, Robin McLaren and Christiaan Lemmen were made during this event.

### **Publications**

- Sengupta, A., Lemmen, C.H.J., Devos, W., Bandyopadhyay, D. and van der Veen, A. (2015) Constructing a seamless digital cadastral database using colonial cadastral maps and VHR imagery : an Indian perspective. In: Survey review, (2015) IN PRESS 11p.
- Lemmen, C.H.J., Bennett, R.M., McLaren, R. and Enemark, S. (2015) A new era in land administration emerges. In: GIM International, 29 (2015)1 pp. 22-25.
- Lemmen, C.H.J., Augustinus, C., du Plessis, J., Laarakker, P., de Zeeuw, K., Saers, P. and Molendijk, M. (2015) The operationalisation of the Continuum of Land Rights at country level. In: Linking land tenure and use for shared prosperity, proceedings of the annual World Bank conference on land and poverty, 23-27 March 2015, Washington DC, United States. 27 p.
- Saers, P., Lemmen, C.H.J., Antonio, D., Augustinus, C., Molendijk, M. and de Zeeuw, K. (2015) Strategy for the further development, use, application, and dissemination of the GLTN Tool ‘Social Tenure Domain Model (STDM)’with focus on Country Level Implementation. In: Linking land tenure and use for shared prosperity, proceedings of the annual World Bank conference on land and poverty, 23-27 March 2015, Washington DC, United States. 34 p.
- van Oosterom, P. and Lemmen, C.H.J. (2015) Cadastre in a changing world : issues and directions : why and what to standardize in land administration?. In: Coordinates : magazine on positioning, navigation and associated technologies : open access, 11 (2015)4 pp. 18-19.
- Lemmen, C.H.J. and van Oosterom, P.J.M. (2015) LADM est maintenant une norme ISO : dernière partie. In: Géomatique, 41(2015)4, pp. 24-27.
- Germann, M., Kaufmann, J., Steudler, D., Lemmen, C.H.J., van Oosterom, P.J.M. and de Zeeuw, K. (2015) The LADM based on INTERLIS. In: From the wisdom of the ages to the challenges of the modern world : proceedings of FIG Working Week, 17-21 May 2015, Sofia, Bulgaria. ISBN: 978-87-92853-35-6. 10 p.
- Louwsma, M. and Lemmen, C.H.J. (2015) Relevance of leased land in land consolidation. In: From the wisdom of the ages to the challenges of the modern world : proceedings of FIG Working Week, 17-21 May 2015, Sofia, Bulgaria. ISBN: 978-87-92853-35-6. 15 p.

- de Zeeuw, K. and Lemmen, C.H.J. (2015) Securing land rights for the world. In: From the wisdom of the ages to the challenges of the modern world : proceedings of FIG Working Week, 17-21 May 2015, Sofia, Bulgaria. ISBN: 978-87-92853-35-6. 19 p.
- Savoiu, C., Lemmen, C.H.J. and Savoiu, I. (2015) Systematic registration in Romania : a new opportunity for land consolidation. In: From the wisdom of the ages to the challenges of the modern world : proceedings of FIG Working Week, 17-21 May 2015, Sofia, Bulgaria. ISBN: 978-87-92853-35-6. 29 p.
- Biraro, M., Bennett, R.M. and Lemmen, C.H.J. (2015) Accelerated land administration updates. In: Advances in responsible land administration / edited by J.A. Zevenbergen, W.T. de Vries and R.M. Bennett. Boca Raton: CRC Press, 2015. ISBN: 978-1-4987-1961-2. pp. 145-162.
- Rugema, D.M., Verplanke, J.J. and Lemmen, C.H.J. (2015) Digital pen method. In: Advances in responsible land administration / edited by J.A. Zevenbergen, W.T. de Vries and R.M. Bennett. Boca Raton: CRC Press, 2015. ISBN: 978-1-4987-1961-2. pp. 131-144.
- Bennett, R.M., Yimer, F.A. and Lemmen, C.H.J. (2015) Toward fit - for - purpose land consolidation. In: Advances in responsible land administration / edited by J.A. Zevenbergen, W.T. de Vries and R.M. Bennett. Boca Raton: CRC Press, 2015. ISBN: 978-1-4987-1961-2. pp. 163-182.
- Molendijk, M., Morales, J.M. and Lemmen, C.H.J. (2015) Light mobile collection tools for land administration : proof of concept from Colombia. In: GIM International, 29 (2015)11 pp. 20-23.
- van Oosterom, P. and Lemmen, C.H.J. (2015) Trends in spatial domain standards : developing a second edition of the land administration model. In: GIM International, 29 (2015)12 pp. 24-27.
- van Oosterom, P. and Lemmen, C.H.J. (2015) The Land Administration Domain Model (LADM) : Motivation, standardisation, application and further development. In: Land use policy, 49 (2015) pp. 527-534.
- Lemmen, C.H.J., van Oosterom, P.J.M. and Bennett, R.M. (2015) The land administration domain model. In: Land use policy, 49 (2015) pp. 535-545.
- Zhuo, Y., Ma, Z., Lemmen, C.H.J. and Bennett, R.M. (2015) Application of LADM for the integration of land and housing information in China : the legal dimension. In: Land use policy, 49 (2015) pp. 634-648.
- Paasch, J.M., van Oosterom, P., Lemmen, C.H.J. and Paulsson, J. (2015) Further modelling of LADM's rights, restrictions and responsibilities (RRRs). In: Land use policy, 49 (2015) pp. 680-689.

### **Actions to be taken in 2016**

- FIG Working Week Christchurch May 2016: the Fit For Purpose guidelines (Enemark, McLaren, Lemmen) will be launched.
- Symposium on Land Consolidation and Readjustment for Sustainable Development - Designing Resilient Landscapes and Empowering Communities, 9 – 11 November 2016, Netherlands. This event is a co-production of FIG (Commissions 7 and 8), FAO and Netherlands Kadaster. Themes: 'Land administration, land consolidation, and readjustment', 'Good governance', 'Sustainable development' and 'Financial arrangements'
- Preparations for the development of LADM Edition II in co-operation with the FIG Standards Network.

### **Events**

### **World Bank Conference on Land and Poverty 2015**

The 16th Annual World Bank Conference on Land and Poverty, held from March 23 – 27, 2015 at the World Bank Headquarters, Washington D.C., US was attended by over 1200 participants from 123 countries. Land governance, land investment, land policies and food security, land reforms and land administration were prominent on the agenda. Well defined land rights are needed to address global challenges – climate, urbanisation, social justice e.a. Land Rights are in a way linked to human rights - this is where legitimacy comes in. Implementations of land administration find foundation on the high level principles as included in the voluntary guidelines on the responsible governance of tenure of land, fisheries and forests from FAO; on the Continuum of Land Rights from UN Habitat and on the Fit-For-Purpose Land Administration from FIG. Land surveyors often bring the accuracy issues to the arena of debate – but there seems to be a growing understanding that coverage and readiness for use is more relevant in order to provide tenure security. And harmonisation between map and registers is important. The issue of "Open Data" comes to the floor. The question which data should be open depends on the local situation (ethics, culture, etc). So called "authentic registers" get attention: data duplication should be avoided; data quality can be improved based on mandatory reporting of inconsistencies or errors by (governmental) users. This type of quality improvement is possible with crowd sourcing solutions. Inclusion of biometric linked property data appeared in the papers and discussions – with cases from India. Cases of fraud and corruption are identified also in complete transparent environments. Crowd sourced land data require verification options in order to bring data at an authoritative quality level. If the institutional issues are not being solved soon, crowdsourcing and Fit-For-Purpose approaches will be the game changer. In general the "technology" was not seen as a problem anymore. The combination of crowd sourced data and high resolution and up to data satellite imagery looks promising. There was a lot of attention to the needs of reliable values for land indicators, FIGs cadastral template where indicators are available and compared at country level can be in support to this demand.

### **Global Land Tool Network Partners Meeting 2015**

The 6<sup>th</sup> Partners' Meeting of the Global Land Tool Network (GLTN) was held at UN in Nairobi, Kenya, 3 - 5 November 2015. About 70 GLTN Partners joined.

Main goals were in strengthening partnership collaboration in the network and in increasing the visibility of land and tenure security in the ongoing global development process. Achievements of the GLTN were discussed in alignment with strategies for implementation of the network's land tools at country level.

The land and tenure security issue was placed in the context of the global development processes: the Sustainable Development Goals of the United Nations, the New Urban Agenda (Habitat III) and FAOs Voluntary Guidelines on the responsible Governance of Tenure of Land, Fisheries and Forests. The discussions revolved around the impact of these processes on the work of GLTN, identified the roles and opportunities for the Partners to engage in these global processes and proposed a way forward.

Very dynamic was the session on the latest thinking on GLTN land tools during an interactive market place session where 13 tools were presented in great detail with an opportunity for the partners to engage. Land tools are practical ways to solve a problem in land administration and management. It is a way to put principles, policies and legislation into effect. The term covers a wide range of methods: from a simple checklist to use when conducting a survey, a set of software and accompanying protocols, or a broad set of guidelines and approaches. The emphasis is on practicality.

The 6<sup>th</sup> GLTN Partners' Meeting came to a close after Oumar Sylla, the newly appointed GLTN Head, addressed the partners by highlighting his vision for the network.

During a pre-conference multi-stakeholder workshop a Fit-For-Purpose (FFP) Land Administration Guide was introduced and discussed. The FFP approach provides a new, innovative and pragmatic solution to land administration. The solution is directly aligned with country specific needs, is affordable and flexible to accommodate different types of land tenure, and can be upgraded when economic opportunities or social requirements arise. The Guide provides structured guidance on building the spatial, legal and institutional frameworks in support of designing the country specific strategies for implementing Fit-for-Purpose land administration.

Very impressive was the visit to the Mashimoni informal settlement where the Social Tenure Domain is implemented. STDM supported residents in organising the community and helped in gathering evidence in land tenure and in the legitimacy of people to land relations in litigation and negotiation. Using STDM is experienced as alternative way of managing land information. There is, for example, reduced conflict in cases as double or triple selling of structures.

### **Co-operation**

There is co-operation with UN-Habitat/GLTN, FAO, OGC and World Bank.

*Christiaan Lemmen, Chair of WP 7.1*

*Vice Chair of FIG Commission 7*

## **Working Group 7.2 – Land Management in Climate Change and Pre- and Post-Disaster Areas**

Chair: Daniel Páez (PhD), Colombia, email: [dpaez@uniandes.edu.co](mailto:dpaez@uniandes.edu.co)

### **Policy Issues**

- assessment of land tenure in post-disaster areas
- pre-disaster assessment / documentation of land tenure
- legal/institutional/technical Fit-For-Purpose methods to secure land rights in pre- and post-disaster areas
- impact of climate change on land tenure / loss of land, land use changes
- compensation for value changes, consolidation of agricultural land, adjustment of urban land in post disaster regions
- new technologies for data capture in pre-disaster areas / validation of third party data
- cooperation models with public authorities / voluntary guidelines in conflicts
- capacity building in disaster response bodies
- spatial data infrastructures for pre-, during and post-disaster response (link to FIG Commission 3)

### **Achievements 2015**

During 2015 the development of the structure of the proposed platform for emergencies and disasters in Colombia was made. This created a conceptual model, which was proved in a pilot- test. In this case, during the first year we had a complete success in the first phase of the project in an appropriate literature review and the design of an applicable platform. In addition, it was successful to involve a significant part of the main players in the risk.

The development of co-operations is outlined especially with the Colombian Company of Topographers, *Procalcúlo*, the French Development Agency and the National Unity of risk management and disaster, creating connections between the private and public sectors.

On the other hand, a website was created to collect and share information of international documents about disasters and emergencies. The website contains the most significant publications which will be updated periodically, a Blog that can accommodate frequent updates and the latest news and a database with point clouds and ortho-photos from different places. This type of SDI is fundamental for developing overarching guidelines and policies that are practical and applicable worldwide. It requests to provide an information service to the community in just one place.

Finally, social cartography, GPS, UAVs and Geographic information system (GIS) were integrated for mapping indigenous lands. Although most of the indigenous territories are recognized in laws as reserves, the lack of proper communities' boundaries and description has made it difficult to elaborate a proper cartographic map, limiting opportunities for land administration. For this reason, was important to investigate the potential of using a designed methodology named Community Mapping Supported by Technology (CMST) in surveying indigenous territories.

### **Conferences/Seminars/Workshops**

- CDMPS International Symposium on Disaster Management. Melbourne, Australia. 12-14 October, 2015
- FIG Working Week. Sofia, Bulgaria. 17-21 May 2015
- Annual World Bank Conference on Land and Poverty 2015: Linking Land Tenure and Use for Shared Prosperity. Washington, US. 23-27 March 2015
- X National Congress and VII International Congress of topographers. Bogotá, Colombia. 17-18 November 2015.
- UN Climate Change Conference-COP21\*CMP11. Paris, France. December 2015.
- National Debate on the State land policy on the theme: "The Land System Reform: For an inclusive and sustainable development". Morocco, Rabat. 8-9 December 2015.

### **Publications**

- Guzman, V., & Paez, D. (2015). Overview of a SDI - Based System to Facilitate Disaster Management in Colombia: Colombian Emergency Response Platform( PCRE). 20.
- Guzman, V., Paez, D., & Rajabifard, A. (2015). *Lessons learn from Colombian Emergency Response Platform (PCRE) and Australian Intelligence Disaster Decision Support Systems (IDDS)-Technical considerations.*
- Páez, D., Mitchell, D., & Zevenbergen, J. (2016). Pointshare.org: a Knowledge Sharing Portal on Land Administration for Climate and Disaster Risk Management. 14.
- Rodríguez, S., Guzman, V., & Páez, D. (2015). Land Administration analysis in the Colombian Emergency Response Platform(PCRE) based in spatial information systems for country's sustainable economic development. 20.

### **Actions to be taken in 2016**

- Improve the conceptual development of the platform and its impact on land administration.
- Support the development of better land information systems that reduce risk.
- Establish networks of professionals from land administration institutes and organisations and from international and national bodies who are in charge of disaster management.
- Raise awareness about the need of appropriate documentation of land rights in disaster situation.
- Facilitate cooperation with the relevant institutions in terms of securing rights of land owners in areas of high risks.

- Analyse about long-term strategies for compensating impacts of climate change on land owners.
- Optimise resources during response activities and help reconstruction efforts after a disaster has occurred.
- Incorporate new data collection technologies, such as by drones, as a core element of better land management for disaster response.
- Participation in regional and international workshops / conferences.
- Contact with global community (UN), NGOs and NPOs.
- International FIG Workshop of Commission 7 on Security of Land Rights in PP disaster areas in 2017 (proposed venue – Bogota/Colombia)
- Web-seminars on key topics and projects.
- Papers in scientific magazines and newsletters.

### **Events**

X National Congress and VII International Congress of topographers, whose slogan in The year 2015 was "The Dynamics of the topography in the post- Colombian agreement". This international event, was held at the Andes university on 17 and 18 November 2015. Main allies were the FIG, the Pan American Association of Professional Land Surveying (APPA), the Regional Autonomous Corporation (CAR), and the Unit of Land Restitution, among others.

The Colombian Society of topographers, an advisory body state, organized this event. The Congress was an opportunity for the academy, the private sector and the state organizations. It was a way to share their views on key issues of the development of Infrastructure, land administration, agrarian Reform and Modernization of the cadaster in Colombia and other countries.

In the event, they talked about the risk management, addressing issues of urban planning and plans for regional integration and mitigation of risk and the relationship between risk management and topography, as an opportunity to save lives.

### **Co-operation**

Cooperation will be with International and regional NGOs and NPOs, disaster response and disaster risk management bodies, governments, citizens, FIG member associations, GIS developers and users, producers of survey equipment and software providers, insurances and re-insurances.

*Daniel Páez (PhD), Chair of WP 7.2  
Vice Chair of FIG Commission 7*

### **Working Group 7.3 – Crowdsourcing of Land Rights**

Dr Robin McLaren, United Kingdom, email: [robin.mclaren@KnowEdge.com](mailto:robin.mclaren@KnowEdge.com)

#### **Introduction**

This progress report has been prepared by Robin McLaren, chair of Working Group 7.3 Crowdsourcing Land Rights, and details progress against the agreed work plan 2015 -2018.

This section describes the agreed work plan for working group 7.3 for the period 2015 – 2018.

#### **Policy issues**

- Family of mobile devices supporting remote and in-situ capture of evidence of land

rights

- Global platforms managing evidence of land rights and obligations
- Service delivery models
- Scalability and capacity building of trusted intermediaries and land owners
- Role of social media / validation of third party data
- Impact on perception of security of tenure
- Managing unintended consequences and privacy
- Cooperation with Public Authorities in recognition or conversion of informal rights
- Link to Working Group 7.1 Fit-For-Purpose Land Administration
- Impact on Land Professionals and associate curriculum

### **Specific project(s)**

Working Group 7.3 aims at establishing permanent links to interest groups and partners from outside FIG for providing a forum for linking technology, society and established stakeholders in order to develop a sustainable, citizen centric structure of services.

The statement on role of Land Professionals will be drafted in co-operation with Commission 1 of FIG.

### **Workshop(s)**

- Participation in Workshops / Conferences
- International joint FIG Commission 7 and Commission 3 Seminar 2015 (Malta/Europe)
- Conference in 2016 (venue - Portugal/Europe)

### **Publication(s)**

- Review and analysis of approaches to crowdsourcing of land rights, identifying pros and cons to regulated procedures
- Guidelines in managing unintended consequences and privacy
- Guidelines in migrating informal land rights to formal land rights
- Statement on role of Land Professionals in the context of crowdsourcing of land rights
- Papers in scientific magazines and newsletters

### **Timetable**

- Review and analysis of approaches will be presented latest at FIG Working Week 2017
- Statement on role of Land Professionals will be prepared for FIG Working Week 2018
- Progress of work and Draft Publications will be presented at FIG Working Weeks during the term of this Work Plan.
- Organising special sessions in FIG events as well as in other specific events throughout the term of this Work Plan.
- Final Report and Guidelines will be presented in FIG Congress 2018

### **Beneficiaries**

Citizens, FIG member associations, international and regional NGOs and NPOs, CSOs, governments, decision makers, GIS developers and users, producers of survey equipment and software providers.

## **Deliverables in 2015**

The major deliverable over this period was the international joint FIG Commission 3 and Commission 7 seminar on “Crowdsourcing of Land Information” held in Malta, 16-20 November 2015. Is crowdsourcing feasible for capturing evidence of land rights and can it help to rapidly shrink the security of tenure chasm? These were the central questions during the joint workshop. About 90 participants attended this joint workshop.

The United Nations’ 2030 agenda for sustainable development includes new Sustainable Development Goals (SDGs) with six of the goals having a significant land component mentioned in the targets. For example in Goal 1, that calls for ending poverty in all its forms everywhere, and Target 4 states that by 2030 all men and women will have equal rights to ownership and control over land and other forms of property. These goals and targets will never be achieved without having good land governance and well functioning, countrywide land administration systems in place. Conventional approaches in land administration have failed so far in developing countries. There is a need for new and scalable approaches in land administration. The workshop showcased the innovative crowdsourcing approaches emerging as one of the potential solutions to reducing the global land tenure divide.

Although the crowdsourcing solutions presented at the workshop have not yet gone to scale, they have clearly demonstrated success in piloting environments: the USAID Mobile Application to Secure Tenure (MAST) project in Tanzania; the Landapp pilots in Ghana and Indonesia to support smallholder farmers; and the Kadaster / Esri / Trimble pilot in Columbia. The approach is certainly proven from a technical and ICT perspective: Apps for the collection of land administrative data are available for mobiles with GPS; extensions are available for positioning with lightweight GNSS devices with sub-meter accuracy; and software tools are available to share the collected data in the cloud for transparent access and for maintenance purposes. Services were presented where countries or communities can store and manage land data and organise access to the land data. Key issues were discussed around standards, certification for Apps, formalisation of crowdsourced land rights, trusted intermediaries within communities and business models to sustain the crowdsourcing initiatives. There was agreement that 'legitimate land rights' and related spatial units can be integrated into formal land administration solutions in step-by-step approaches.

Integration of crowdsourcing with the Fit-For-Purpose approach to land administration is possible. However, the concept of crowdsourcing needs to build trust with society to be ultimately accepted and adopted.

Papers and presentations are available on the Commission 7 website.

## **Activities planned for 2016**

- Working Group 7.3 members will meet in Christchurch in May and will focus on a review and analysis of approaches to crowdsourcing of land rights, identifying pros and cons to regulated procedures.
- Commission 7 Annual Meeting will be held in Portugal 23–28 October 2016 and special sessions will be held on Crowdsourcing Land rights.
- A website providing information on the latest developments in crowdsourcing of land rights will be established.
- During the Malta seminar a major focus of discussion was on the Rise of the Trusted Intermediary and the role of Land Professionals in the context of crowdsourcing of land rights. Working Group 7.3 will make contact with Commission 1 during the

Christchurch Working Week to start the process of creating a joint statement on role of Land Professionals in the context of crowdsourcing of land rights.

*Dr Robin McLaren, Chair of WP 7.3  
Vice Chair of FIG Commission 7*

## **Working Group 7.4 – Citizen Cadastre**

Chair: Gyula Iván (M.Sc.), Hungary, email: [ivan.gyula@fomi.hu](mailto:ivan.gyula@fomi.hu)

### **Policy Issues**

- land tenure and culture and society needs
- multi-dimensional and multi-temporal cadastre
- security of land tenure
- alternative forms of land tenure in changing society (generation property, affordable land, temporary urban and agricultural land tenure) complementary to WG 7.1
- role of land owner as key stakeholder
- privacy issues / access to data for citizens
- responsibilities of public authorities / cooperation models / fraud prevention
- analysis of trust in different land administration models
- assessment models for performance of land administration systems
- training of land owners / capacity building in institutional bodies
- building codes and IPMS
- standards for data in land administration
- representation in Joint WG on 3D Cadastre of Commission 3 and 7

### **Achievements 2015**

At the FIG Working Week in Sofia, Bulgaria, Dr. Conrad Tang and his PhD Student Haongdong Zhang recommended a scientific method for the assessment of cadastral systems. The method was presented in detail at the FIG Commission 7 Annual Meeting in Malta as well. WG 7.4 intends to disseminate the questionnaire to professionals and relevant institutions all around the world to get to a clear situation about the quality of cadastral systems.

In April 2015, the World Cadastral Summit was held in Istanbul, Turkey. At this meeting the Istanbul Declaration was signed by most of the participating countries. It is very important from the point of view of WG 7.4, that :

„A “Cadastral Affairs” initiative on a global scale is needed within the pattern of the United Nations or other similar global organizations. In this context, an “International Association of Cadastre” and a “Cadastre Research & Development Center” is to be formed at the global level; to contribute to the further developments of the country's cadaster services by training and consulting and producing solutions to solve problems“. WG 7.4 will be active in the following years to support this initiative, connected to the activities of the WG.

### **Conferences/Seminars/Workshops**

2015 there were no events organised by WG 7.4. WG 7.4 will support for the organisation of the agenda for the international Seminar in Coimbra/Portugal in autumn 2016.

### **Publications**

Conrad Tang's and Haongdong Zhang's questionnaire: <http://goo.gl/forms/O34LVGyTbQ>

### **Actions to be taken in 2016**

The Annual Meeting of Commission 7 will be held in Portugal, 2016. Because of the limited actions taken in 2015, WG 7.4 will improve their activities in 2016. Such actions should be as follows, according to the workplan:

- land tenure and culture and society needs
- multi-dimensional and multi-temporal cadastre
- security of land tenure
- alternative forms of land tenure in changing society (generation property, affordable land, temporary urban and agricultural land tenure) complementary to WG 7.1
- role of land owner as key stakeholder
- privacy issues / access to data for citizens
- responsibilities of public authorities / cooperation models / fraud prevention.

One of the issues will be to encourage cadastre and land registration authorities to improve their connections to other public administration bodies and authorities.

### **Events**

FIG Commission 7 Annual Meeting in Portugal 2016. This event will among others focus on WG 7.4 activities, such as societal needs, e-public administration, 3D issues, security for citizen and new forms of land tenure etc. Final themes will be launched after consultations in the Commission before summer 2016.

### **Co-operation**

There is no direct cooperation with other Commissions or WGs till now.

Since FIG WW 2015 Sofia, the HongKong University of Technology has shown their interest for permanent involvement into the work of WG 7.4. This partnership has been developed continuously and will be further extended by additional interest groups.

*Gyula Iván (M.Sc.), Chair of WP 7.4  
Vice Chair of FIG Commission 7*

### **Joint Working Group on 3D Cadastre of Commission 3 and 7**

Chair: Prof. Dr. Ir. Peter van Oosterom, Commission 3, The Netherlands,  
email: [P.J.M.vanOosterom@tudelft.nl](mailto:P.J.M.vanOosterom@tudelft.nl)

There has been a lot of 3D Cadastre activities during 2015.

### **Conferences/Seminars/Workshops**

A considerable number of papers with 3D Cadastre content were presented in the World Cadastre Summit Conference in Istanbul/Turkey, 20-24 April 2015 and in the FIG Working Week 2015 in Sofia/Bulgaria, 17-21 May 2015.

In the Joint Workshop and Annual Meetings of FIG Commission 3 & Commission 7 in Malta, Nov 2015, some of the papers focused on 3D Cadastre related issues:

- How to utilize the Citizens to gather VGI as a Support for 3D Cadastre Transition (Nikola Vučić – Vlado Cetl – Miodrag Roić, Croatia)
- A Multi-Dimensional Land Information System for upgrading Urban Settlements (Chryssy Potsiou – Charalabos Ioannidis, Greece)
- 3D Cadastre Modelling of Customary Real Property Rights (Efi Dimopoulou, Greece)

After the previous 3D Cadastre workshop in Dubai, there have been initiatives and now work in progress to create overview/best practice papers by 2 (out of the 4) working sessions themes:

1. Legal framework for 3D Cadastre and
2. Initial registration of 3D parcels.

The WG aims at preparing for a FIG publication on '3D Cadastres best practices'.

From 28-30 October 2015, the Joint International Geoinformation Conference JIGC 2015, including among others 3D GeoInfo, was organized in Kuala Lumpur/Malaysia. Several 3D Cadastre related presentations were given in the event. The day before the JIGC 2015 several tutorials were organized, of which one addressed 3D Cadastres.

Last but not least, the themed issue on Land Administration Domain Model (LADM, ISO 19152) for the journal Land Use Policy is nearly completed: all accepted papers are now being processed and publication is expected soon. In total there are 16 papers in the themed issue, of which 2 are 3D Cadastre related:

- The Importance of Malaysian Land Administration Domain Model Country Profile in Land Policy (Nur Amalina Zulkifli, Alias Abdul Rahman, Peter van Oosterom, Tan Liat Choon, Hasan Jamil, Teng Chee Hua, Looi Kam Seng, and Chan Keat Lim)
- Improvement of the Korean LADM country profile to build a 3D Cadastre Model (Bo-Mi Lee, Taik-Jin Kim, Byung-Yong Kwak, Young-Ho Lee, and Jinmu Choi)

### **Actions to be taken in 2016**

The FIG 5<sup>th</sup> International Workshop on 3D Cadastres will be organized in Athens Greece, 18-20 October 2016. Together with the 11<sup>th</sup> 3D GeoInfo Conference, 20-21 October 2016, this is part of the Joint 3D Athens Conference 2016.

*Prof. Dr. Ir. Peter van Oosterom,  
Chair of Joint WP on 3D Cadastre*

### **Cadastral Template 2.0**

Project leaders: Daniel Steudler (PhD), Switzerland, email: [Daniel.Steudler@swisstopo.ch](mailto:Daniel.Steudler@swisstopo.ch) and Prof. Abbas Rajabifard (PhD), email: [abbas.r@unimelb.edu.au](mailto:abbas.r@unimelb.edu.au)

The Cadastral Template is a collection of descriptions of cadastral systems, which has been established in 2003 and updated and maintained since then.

As of February 2016, there are cadastral descriptions of 50 countries across all continents available to the public. See [www.cadastraltemplate.org](http://www.cadastraltemplate.org)



During the Annual Meeting of Commission 7 in Malta in November 2015, the national delegates put a special focus on Section C (Purpose / Types / Concept / Content) of the template and updated and discussed the issues involved.

The Cadastral Template will continuously be updated and maintained, preferably before the annual meetings of Commission 7, in order to serve as an information resource for cadastral systems.

Increasing needs and requirements for global information on national land registration systems have recently initiated considerations among interest groups in Europe to build upon the existing information tools for a comprehensive service.

*Daniel Steudler (PhD), Switzerland*  
*Prof. Abbas Rajabifard (PhD)*

## **FIG Standards Network**

Representative: Chair: Dr. Ir. Christiaan Lemmen, The Netherlands, email:

[Chrit.Lemmen@kadaster.nl](mailto:Chrit.Lemmen@kadaster.nl)

Commission 7 is represented in the FIG Standards Network by Dr. Ir. Christiaan Lemmen (NL). All Working Groups are linked to the topics.

## **Cooperation with United Nation Organisations, Sister Associations and other Partners**

FIG Commission 7 keeps close co-operation with partners such as World Bank, UN agencies, UN Habitat, UN FAO, UN ECE, UNESCO and others. Commission officers and delegates are active participants in all events of these partners whenever the topic is linked to cadastre and land management. Information about joint initiatives and projects may be obtained from the reports of the WGs.

Involvement into the activities of UN GGIM is getting an issue for Commission 7. Delegates are members of UN GGIM Working Groups as well as attending the annual expert meetings at the Headquarters of UN in New York.

As mentioned in the report of WG7.1 the Commission is active in the GLTN. On 13 January 2016, the Korea Land and Geospatial Informatix Corporation (aka LX Corporation) became GLTN's 71st partner.

The 20th UNRCC-AP and the 4th UN-GGIM AP had been held on 5-10 October 2015 in Jeju Island, Republic of Korea. FIG representatives, as the former President Teo CheeHai and Julie Hyunsook, LEE (Vice President of FIG Com 7) and Danilo Antonio, UN-Habitat (GLTN) participated in the conference. It has been an excellent opportunity to promote the evolving role of land surveyors to support the sustainable development goals in 56 Asia-Pacific countries and to promote the role of FIG in facilitating closer co-operation and collaboration between local professionals and international organizations in the Asian-Pacific region.

*Gerda Schennach*  
*Chair, FIG Commission 7*

February 2016

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