International Federation of Surveyors
Fédération Internationale des Géomètres
Internationale Vereinigung der Vermessungsingenieure

FIG

**Report to the 47th General Assembly
FIG Working Week 2024, Accra, Ghana**

FIG Commission 7 – Cadastre and Land Management

Report of Activities 2023

1. General

Cadastral surveyors have long recognised the value of a global perspective on land administration – for building technical consensus, supporting advocacy and awareness, and advancing the domain. The 2023-26 period is building on this tradition. Commission 7 kicked off its new term in 2023 with the following highlights:

- Welcomed new **C7 Chair** (Rohan, Australia), **Vice Chair** (Kirsikka, Finalnd), and **Officers** in **January**
- Attended the **FIG 2023-26 kick-off workshop** in Copenhagen, Denmark in **February**
- Co-organised international workshop in **Nepal on Integrated and (de)Centralised Land Management and Administration** in **March**
- Collaborated with UNGGIM Expert Group on Land Administration and Management (EG-LAM) and UNGGIM-AP at events in Singapore (**March**) and **Indonesia** (**November**), specifically focusing on supporting the UN endorsed Framework for Effective Land Administration (FELA)
- Had WG7.5 lead on advocacy towards women's access to land by attending the 67th UN **Commission on the Status of Women 67** (**March**) and the **Conference on Land Policy in Africa** (**November**)
- Finalised our co-created **2023-26 Workplan**, including 8 Working Groups, and had it approved in **May**, with agreement to reach out and work closely with **UNGGIM, UN-ECE WPLA, UN-Habitat, World Bank, FAO, and Stand-for-her-Land**, amongst many others
- Had a big **FIG Working Week in Orlando** in **May**, with over 100 C7 papers
- Conducted the awesome and 'sold out' **FIG 2023 C7/C2 Annual Meeting** in Deventer, Netherlands in October with +100 participants and almost 50 papers
- Co-organised the **11th International Workshop on LADM & 3D Land Administration** in Sweden in **October**
- Kicked-off or contributed to many academic **Special Issues** in the domain of Land Administration
- Renewed all our communications, with an **updated website**, regular **news briefs**, new C7 FIG **LinkedIn** pages, social media groups (**WhatsApp**), and added 10 new verses to our C7 song ;)

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2. Working Groups

2.1 WG 7.1 Framework for Effective Land Administration

The Framework for Effective Land Administration (#FELA) was endorsed by UNGGIM committee of experts in August 2020. It directly links the work of cadastres and land administrators with the SDGs and the global agenda. Since then, FIG has been actively supporting UNGGIM, via its Member Associations, to advocate, trial, and implement the framework. Chaired by **Amalia Velasco** of Spain, between 2023-26, WG7.1 is leading on this work. The WG attended several UNGGIM meetings across 2024 including the UNGGIM-AP executive meeting in March 2023, and the 10th UNGGIM-AP in November. It also had a dedicated session in Orlando. At Deventer, there was also a standalone session on FELA and its implementation. Amalia Velasco (Spain) introduced and updated on the "Framework for Effective land Administration (WG7.1) Work Plan 2023-2026". A new and highly innovative work was presented by Mengying Chen (China), who spoke on "SDG Land Administration Indicators based on ISO 19152 LADM". All these efforts in 2023 were about network building and data capture, with a view to developing a joint publication with UNGGIM-EGLAM in 2025 on implementation of FELA.

2.2 WG 7.2 Fit for Purpose Land Administration

Fit for Purpose Land Administration (FFPLA) has been driven and supported by FIG C7, UN-Habitat, and the World Bank for over a decade. There are policy guides, implementation support, and academic publications. There also remains resistance within the land administration community. WG 7.2, led **by Israel Taiwo**, recommits to C7s FFPLA advocacy work. The state-of-play, best practices, and new developments are being shared and captured through several initiatives. The WG has a regular online meeting series for all interested stakeholders. Additionally, the WG was active in both Orlando and Deventer in 2023. In Deventer, the FFPLA A session on FFPLA included papers Menare Royal Mabakeng (Namibia) with "Engagements for Advancing the Objectives of the Fit-for-Purpose Land Administration Working Group: A Call to Action", Kees de Zeeuw (The Netherlands) with "Cadastral System Implementations Using GIS", Christelle van den Berg (The Netherlands) with "Boosting Land Administration modernisation in Benin with Fit for Purpose Land Administration", Trias Aditya (Indonesia) with "Visualizing Title Uncertainties and Quality Issues in Digital Era of Land Administration" and Helge Nysæter (Norway) with "Cadastral Surveying and Computation Methods". FFPLA has been a focus for C7 for over a decade. It's great to see the WG now being Chaired out of Africa and so many new case stories being shared. A new publication is on the way.

2.3 WG 7.3 3D Land Administration and LADM

LADM ISO 19152 has been an ISO standard since 2012. FIG C7 and C3 played leading roles in its development, with **Peter van Oosterom the** Chair. The standard is in the process of review and renewal. It is expanding and integrating. 3D land administration is part of the expansion. The long-standing WG 7.3 recommits to the important work and program of international workshops to support this knowledge creation and standardisation work. It is the longest standing working group in Commission 7. It's been directly involved, for well over a decade (if not 2!?), with the development of both 3D land administration –

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in terms of concepts, demos, and national surveys - and also the ISO 19152 LADM standard (2012), and its subsequent review and update (currently ongoing). The WG had sessions in Orlando and Deventer. It also organised the 11th International Workshop in Gavle, Sweden in October. In the Deventer AM, papers in these sessions included Peter's talk on "Integration of multiple data sources for 3D Land Administration through the lifecycle of 3D objects"; Doris Smudde's (The Netherlands) "BIM Legal the standard for the 3D transformation of legal certainty for apartment law"; Jantien Stoter's (The Netherlands) "BIM Legal: defining a standard for 3D cadastral registration of apartment complexes"; and Gerlof de Haan (The Netherlands) with "Totally 3D" presented their papers.

2.4 WG 7.4 AI and Remote Sensing for Land Administration

Artificial Intelligence (AI) brings opportunities and threats to land administration. WG 7.4 takes a technical focus looking at how AI can support reimagining cadastral data capture (i.e., automatic boundary detection), process automation (e.g., OCI vs ICR), and cadastral data analytics. It is directly linking to academia and R&D developments with ISPRS and private sector actors. The WG had sessions at both Orlando and Deventer in 2023. In Devenbter, the C7 AM was led by Chair, **Dr. Mila Koeva (Bulgaria)**. This hot topic area and bumper session included papers from Jeroen Grift (The Netherlands) on "Toward Large Scale Cadastral Mapping with Deep Learning: A Benchmark Dataset"; Ron Dalumpines (USA) on "How AI can be used in land management? "; Kim Jeong O (Republic of Korea) on "Efficiency of cadastral survey work through combining of GNSS devices and AR technology"; Linda M. Foster, PLS, GISP, MGIS Foster (USA) and Mazin Shahwarzi (Oman) on "Together, AI and GIS Strengthen Land Administration in Oman"; Uttam Pudasaini (Nepal) on "Drones and Web GIS based Street Naming and Household Addressing System: A case of Changu Narayan- An Urbanizing Municipality from Kathmandu, Nepal"; Stefan Bussemaker (The Netherlands) with his "Overview of AI Applications at The Netherlands' Cadastre, Land Registry and Mapping Agency"; and Simon Šanca (Norway) with his paper on "Automatic Georeferencing of Land Consolidation Maps with AI". The group is seeking to act as a hub for all knowledge creation and sharing around all aspects of AI/RS in our domain. With lots of R&D over the previous decade, and now increasing numbers of scaled case examples, this group is one to watch.

2.5 WG 7.5 Women's Access to Land (and Administration)

This working group is extremely active at in-person events and online. It is highly collaborative. It is led by led by **Marisa Balas (Mozambique/Netherlands)** and **Kate Fairlie** (Australia); and formally Claire Buxton (Canada/New Zealand). In terms of key highlights, attended and advocated for the role of FIG at the 67th UN Commission on the Status of Women 67 (March) and the Conference on Land Policy in Africa (November). At Orlando, 2 sessions were dedicated to the WG: one paper session; and one panel form. Collaboration and inputs with esri, World Bank, and S4HL were well appreciated. At the Deventer AM a session on S4HL (Stand 4 Her Land) and FIG Publication 24 (being reviewed as part of the WG7.5 C7 workplan) were included. Here, Prof Iyenemi Ibimina Kakulu (Nigeria) presented on "Halting land degradation through equitable land access and land ownership by Women". Sara Garcia Ortiz (The Netherlands) spoke on "Healing Mother Earth: Arhuaco indigenous women and the defence of their ancestral territory". There was

also a lunch session specifically looking into the scope and plans for the Publication 24 update. Later in November Claire Buxton from WG7.5 attended at the recent S4HL Steering Committee meeting. From Claire: *"The Working Group on Women's Access to Land (WG7.5) is continuing FIG's partnership with the Stand For Her Land (S4HL) campaign. As a very early S4HL partner, FIG members have a role to play in helping close the gap between policy and reality when it comes to women's land rights and access to secure tenure. By demonstrating how the FIG operates, shares knowledge, and implements change, we provided a picture of FIG as a guidepost by which the campaign may further establish working relationships with other partners as the campaign grows. Special appreciation was given by the Steering Committee of the voluntary nature of our work as FIG members."* From Diane Dumashie: "*This is the beginning of action, the evolution is in the hands of you and your colleagues. But with FIG diversity and inclusion agenda...space will continue to be made especially in our working week.*" Finally, to round out the year, FIG Commission 7 WG7.5 (Women's Access to Land) was present and active the Conference on Land Policy in Africa (CLPA) in Addis Ababa, Ethiopia, 21-24 November. The event also hosted the 1st High-Level Forum meeting (HLFM) of presidents of land associations in Africa, on the 20-21 November. The African Union Commission (AUC), the International Federation of Surveyors (FIG), the Africa Regional Network (ARN), and the S4HL Campaign participated in the roundtable discussion of synergies to promote WLRs and ensure a people's centred land governance. The meeting was organized by the FIG Commission 7 working group on Women's Land Rights and the FIG SDGs Task Force. Marisa Balas (FIG SDGs TF and FIG Commission 7 working group 7.5 Women's Land Rights chair) made a presentation focusing on specific good practices in the areas of legal reform and institutional capacity-building, with special attention to social institutions, to promote equitable land rights and enhance land tenure security. The findings are based on specific practices in documenting customary and statutory access, control, and ownership of land.

2.6 WG 7.6 Digital Transformation for Integrated Land Management

We always hear that sustainable land management demands integrated land tenure, cadastre, and land use planning – both the data and the processes (check out Stig Enemark's well known 'Land management paradigm'). But does this really happen in practice? At the same time, digital transformation reshapes our everyday lives and land administration processes. Led by **Dr. Claudia Lindner and Walter De Vries**, WG 7.6 takes up the challenge and explores, if and how, digital transformation improves the integration of land management and administration. Working with C8, the team is reimagining what 'integration' really means, discuss relevant practices within countries, and explore emerging tools/techniques. The topic of the WG was the theme for the international workshop in Nepal in February 2023, co-organised by FIG C7 and C2. Meanwhile, the AM in Deventer was also a highlight for 2023. From Claudia: *"We're looking back on a really interesting session during the Annual Meeting in Deventer, with presentations from i) Spain, about the current landscape of land management and land administration in that country; ii) Nepal, on the development of a geoportal supporting the Nepal government to streamline data management; iii) Poland, where we had a discussion about the management of allotment gardens in Warsaw; and iv) the Netherlands, on the use of innovative technology to register solar parks in the Netherlands. These are great early inputs into our planned publication on this topic of digital transformation and integrated land*

management. I invite all C7 members and friends to have a look at the event website to get more insights about the presentations."

2.7 WG 7.7 Land Administration Education

Land Administration education is at the cross-roads. In more developed contexts, renewal is needed, as professional associations struggle to attract and train professionals. In emerging contexts, the challenge is lack of available resources and staff to do the training. One challenge is that education and training pathways vary greatly across countries. There is high fragmentation. This means less visibility for school leavers. Working with C2, WG 7.7 is recommitting to develop a global guide for land administration curriculum and review the state of play of land administration curriculum globally – seeking to identify strengths, weaknesses, and opportunities for global awareness and advocacy. Led by **A/Prof. Simon Hull** out of Capetown University, South Africa, with great from **Grazyna Wiejak-Roy**, and **Royal Mabakeng**, WG has been meeting regularly online since the beginning of 2023. The C7/C2 was a highlight for 2023. This included a full session in the regular program, and a full 1-day program at the new building of the ITC Faculty, Enschede, for this WG. From Simon: *"We had a full session on day 2 (Tuesday) with 5 presentations squeezed into one hour. Presentations included discussions around accreditation, defining land administration, a global survey on land surveying education, cadastral and land administration in Nordic countries, and the launch of the abridged version of the GLTN structured knowledge base for responsible land administration by Stig Enemark. On day 3 (Wednesday) we travelled to the new ITC campus in Enschede where we presented a SWOT analysis on the structured knowledge base prepared by several working group members. A panel discussion followed as Jaap Zevenbergen, Stig Enemark and Royal Mabakeng responded to some of the points raised in the SWOT. Dimo Todorovski and Simon Hull concluded with presentations on how they have used modules 4 and 1 of the structured knowledge base in their teaching. Overall, this was a successful 'launch' of the LA Education working group and we look forward to more involvement and further engagements to come."*

2.8 WG 7.8 Comparative Cadastres

Remember Cadastre 2014? Wasn't it just great? Well, don't worry, it's still very much alive and well. That said, there is increasing interest from stakeholders outside FIG to access and share information about national cadastres and land administration systems. But, what exactly do they want? What does the land administration community want? How do we best go about capturing, curating and sharing this information? This is what WG7.8 is all about. This group was put on hold at the start of 2023 whilst the FIG Knowledge Taskforce completed its review of FIG IP and management. It kicked off more formally at Deventer, although, it did have a session in Orlando. At the C7 AM, **Charl-Thom H. Bayer** (Namibia) led a robust discussion, acknowledging the ongoing 'Knowledge in FIG' think-tank work being led by Daniel Steudler (FIG Vice President) and Eva-Maria Unger (OICRF Director). Papers were presented by Karolina Itäinen (Finland) on "Prominent Themes and Challenges in Comparing Cadastral Systems" and Charl-Thom on "Comparative Land Data for Land Administration Innovation. A more detailed concept note looking into

capturing the needs/wants of the broader land sector, and envisioning the different options for sharing the data is currently being compiled, based on the discussions.

3. Cooperation

Major points of collaboration in 2023 included:

- **FIG Commission 1** via WG 7.5 on Women's Access to Land
- **FIG Commission 2** via WG 7.7 on Advancing Land Administration Education
- **FIG Commission 3** via WG 7.3 on LADM and 3D Land Administration
- **FIG Commission 8** via WG 7.6 on Integrated Land Use Planning and Land Administration
- **FIG OICRF / FIG Knowledge Taskforce** via WG 7.8 Comparative Land Administration
- **FIG SDGs Taskforce** via WG 7.1 Framework for Effective Land Administration; WG 7.5 Women's Access to Land; and WG 7.2 Fit for Purpose Land Administration (including the identification of a FIG C7 liaison for the SDGs Taskforce).
- **FIG Standards Group** via WG 7.3 on LADM and 3D Land Administration
- **UN-GGIM** via WG 7.1 Framework for Effective Land Administration
- **esri** via WG 7.2 Fit for Purpose Land Administration; WG 7.4 Artificial Intelligence and Land Administration
- **ISO** via WG 7.3 LADM and 3D Land Administration
- **ISPRS** via WG 7.4 Artificial Intelligence and Land Administration
- **Land Portal** via WG 7.8 Comparative Land Administration
- **OGC** via WG 7.3 LADM and 3D Land Administration
- **Stand for Her Land** via WG 7.6 Women's Access to Land
- **Trimble** via WG 7.4 Artificial Intelligence and Land Administration
- **World Bank** via WG 7.5 on Women's Access to Land; WG 7.6 Integrated Land Use Planning and Land Administration

4. Events

Major events organized, co-organised, or with formal inputs included:

- **FIG 2023-26 kick-off workshop** in Copenhagen, Denmark in **February**
- **Integrated and (de)Centralised Land Management and Administration,** International workshop in Nepal on in March
- Collaborated with **UNGGIM Expert Group on Land Administration and Management** (EG-LAM) and **UNGGIM-AP** at events in Singapore (March) and Indonesia (November)
- Attendance at **67th UN Commission on the Status of Women 67 (March)** and the **Conference on Land Policy in Africa** (November)

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- **FIG Working Week** in Orlando in May, with over 100 C7 papers
- **FIG 2023 C7/C2 Annual Meeting** in Deventer, Netherlands in October with +100 participants and almost 50 papers
- **11th International Workshop on LADM & 3D Land Administration** in Sweden in **October**

5. Communication and publications

For C7, 2023 has been very much a kick-off year. No new publications were released, however, up to 8 new FIG publications, or affiliated publications i.e., as either report, guide, or affiliation with academic journals, are planned for the 2023-26 period.

6. Other highlights

The famous FIG Commission 7 song is back. Continuing on the tradition started by Jurg Kaufman back in the 1990s, here are the new lyrics from 2023 Deventer:

In this world, you'll find a Commission, a better Commission you'll never see.
And this is our Commission 7, Commission 7 of FIG
And this is our Commission 7, Commission 7 of FIG

Commission 7 is for Cadastres, the peak professional body globally
You must be part of Commission 7, Commission 7 of the FIG
You must be part of Commission 7, Commission 7 of the FIG

It costs nothing to be friends with the Commission, but you must pay your registration fees,
Pay your fees to Commission 7, to avoid financial penalty
Pay your fees to Commission 7, to avoid financial penalty

Now Jurg Kaufmann, a Swisse with mus'cal talent, penned a lovely little melody
It's the song of Commission 7, by himself Mr. Cadastre 2014
It the song of Commission 7, by himself Mr. Cadastre2014

This year we're gathering in Deventer, a lovely Hans-e-a-tic City
For the Annual Meeting of Commission 7, Commission 7 of the FIG
For the Annual Meeting of Commission 7, Commission 7 of the FIG

The Netherlands has its Kadaster, a gift from Napoleon in the' 1830s
Kadaster loves Commission 7, Commission 7 of the FIG
Kadaster loves Commission 7, Commission 7 of the FIG

We're so lucky to have our sponsors, esri, Trimble, Leica, VNG
Thanks on behalf of Commission 7, Commission 7 of the FIG
Thanks on behalf of Commission 7, Commission 7 of the FIG

Amalia, Israel, and Peter; Mila, Marisa, Claudia, Simon, Tommy,
Working Group Chairs of Commission 7; Commission 7 of the FIG
Working Group Chairs of Commission 7; Commission 7 of the FIG

FFP, LADM, and FELA; SHL, TERLA, AI and SDGs
They're acronyms of Commission 7; Commission 7 of the FIG
They're acronyms of Commission 7; Commission 7 of the FIG

We've worked hard for two days together; and we've drunk more than only tea
It's fun to be with Commission 7; Commission 7 of the FIG
It's fun to be with Commission 7; Commission 7 of the FIG

Let's finish off by toasting to together, toasting in Dutch, counting Een! Twee! Drie!
It's a toast to Commission 7, Commission 7 of the FIG
It's a toast to Commission 7, Commission 7 of the FIG

Ok, I think we have to stop now; otherwise it could be that people flee
Sing once more of Commission 7, Commission 7 of FIG
Sing once more of Commission 7, Commission 7 of FIG