Land Information Systems: From Isolated Cadastre to an Integrated Digital Ecosystem - A Transformation Example: The OneLand© Platform

Jean-Philippe Lestang (France)

Key words: Access to land; Digital cadastre; e-Governance; Land management; Land Information Systems (LIS); Digital Cadastre; Land Governance; Land Tenure Security; Artificial Intelligence; Blockchain; OneLand© Platform

SUMMARY

The global transformation of Land Information Systems (LIS) reflects a broader shift toward digital governance, driven by urbanization, climate imperatives, and demands for land justice. Historically, land administration relied on paper-based cadasters, but since the 2010s, governments have prioritized digital modernization to address insecurity affecting 70% of the world population, enhance transparency, and support sustainable development. This evolution is marked by four phases: basic digitization (1990–2005), sectoral integration (2005–2015), multi-stakeholder ecosystems (2015–present), and the emergence of AI and blockchain for adaptive, tamper-proof systems.

Global Trends and Challenges

By 2020, 42% of countries had integrated digital cadasters, up from 8% in 2005. Modern LIS now serve multiple goals—securing land rights, attracting investment, and enabling climate resilience—while facing cybersecurity risks. Open-source initiatives like FAO's SOLA and IGNFI's projects in Africa (e.g., UGNLIS in Uganda, SIGFU in Côte d'Ivoire) highlight the need for context-adaptive solutions. Governments demand interoperable, scalable systems that align with local regulations and budget constraints, as multilateral funding declines.

OneLand: A Modular, Field-Tested Platform

Developed by IGNFI and NeoGeo, OneLand builds on lessons from 15+ projects (e.g., Burundi's PRPPB, Mali's SIGEF). It addresses real-world challenges: offline functionality, parametric workflows, and API-driven interoperability. The platform's tripartite architecture

includes:

OneLand Registry: Core administrative tools for rights management, cartography, and reporting.

OneLand E-services: Public portals, mobile apps, and e-payment systems for citizens and professionals.

OneLand Field: Mobile data collection with GPS, quality control, and mass certificate generation.

Technological Innovations

OneLand leverages AI for document digitization, change detection, and predictive analytics, while blockchain ensures data immutability—critical in contexts with weak administrative integrity. Its open-source stack (Django, PostGIS, GeoServer) prioritizes:

No-code parametrization: Admins configure workflows without custom development, cutting costs by 30–40%.

Offline resilience: Designed for low-bandwidth environments, syncing data when connectivity resumes.

Standardized APIs: Enables seamless integration with urban planning, tax, and environmental systems.

Strategic Deployment

OneLand's success hinges on process simplification, legal recognition of digital data, political commitment, and capacity building. Case studies in Uganda, Côte d'Ivoire, and Tanzania demonstrate its impact on land security, economic productivity, and governance. By balancing flexibility with standardization, OneLand exemplifies the future of LIS: adaptive, inclusive, and sustainable.