

SmartLandMaps - from Customary Tenure to Land Information Systems

Auriol Degbelo, Claudia Stöcker (Germany), Kaspar Kundert (Rwanda) and Malumbo Chipofya (Netherlands)

Key words: Cadastre; Digital cadastre; Geoinformation/GI; Low cost technology; Standards; customary tenure; participatory mapping; semantic technologies

SUMMARY

Millions of customary land rights are still undocumented worldwide. Recording and digitizing the plurality of these land rights has been identified as a key challenge in previous work. Documentation is an essential step to make effective progress towards a more sustainable future of our planet and for achieving the SDGs, with Goal 1 “No Poverty” (Indicator 1.4.2: proportion of total adult population with secure tenure rights to land) in particular.

To advance the documentation of customary land rights, SmartLandMaps follows an approach based on three pillars: acceptance, efficiency, and flexibility.

Acceptance: We envision participatory land tenure documentation and mapping as the main use case for our approach. Early involvement of local communities allows for co-creation and fosters co-ownership of land data. Ultimately, participation increases the acceptance of the results.

Efficiency: We use state-of-the-art computer-vision techniques to speed up the digitization of spatial geometries and sketches collected during participatory mapping approaches. Legal claims will be recorded on the spot based on locally-adopted domain models.

Flexibility: We use knowledge graphs as a technology to support the recording of, and advanced question answering about customary land rights. The benefits of knowledge graphs are manifold. First, they can be open or closed, supporting both enterprise and scientific use cases. Second, they provide a very flexible data model. Contrary to traditional approaches that require the definition of a rigid database schema and suffer from maintenance issues when changes arise, knowledge graphs model data as nodes and relationships between entities. Such graphs can be easily extended when updates occur (e.g. changes of existing land rights or evolution of user requirements). The third

SmartLandMaps - from Customary Tenure to Land Information Systems (11155)

Auriol Degbelo, Claudia Stöcker (Germany), Kaspar Kundert (Rwanda) and Malumbo Chipofya (Netherlands)

FIG e-Working Week 2021

Smart Surveyors for Land and Water Management - Challenges in a New Reality

Virtually in the Netherlands, 21–25 June 2021

benefit of knowledge graphs is that they support the recording of semantically-rich information, easing thereby the integration with other data sources (e.g. existing local land use plans).

With our approach, we contribute to the advancement and sustainability of efforts to record customary land rights worldwide and bridge the gap between low-tech, participatory mapping, and modern Land Administration Systems. In particular, we put a strong emphasis on fostering the reuse of collected datasets through the use of semantic technologies.

This article will introduce key issues addressed and the opportunities offered by our approach.

SmartLandMaps - from Customary Tenure to Land Information Systems (11155)
Auriol Degbelo, Claudia Stöcker (Germany), Kaspar Kundert (Rwanda) and Malumbo Chipofya (Netherlands)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021