FIG Working Week 2024
19-24 May
Accra, Ghana
Your World, Our World: Resilient Environment and Sustainable Resource Management for All

Spatial Framework in Chad

An Assessment using COFLAS and the MCC Land Records and Transaction Systems Technology Toolkit for Effective Land Administration

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Context - Chad

- Statistical Information
  - Population: app. 17 million (app. 2 million in N'Djamena)
- Landlocked country (desert north - Sahara, Sahelian belt – center, Sudanian Savanne south)
- Chad's land legislation dates back to 1967 and the body of law is poorly applied
- Reflected in no. of land conflicts in both urban and rural and also reflected in low no. of existing land titles
- Instable political situation – change of leadership

Research Aim

Synthesis the finding of a pilot study in Chad in 2022

Using both parts of the MCC Land Records and Transaction Systems Technology Toolkit

COFLAS

To assess the spatial data acquisition methods and draw a vision for the maintenance of a robust spatial framework in Chad

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Overview – different Demonstrations/Methodologies

1. Conventional Total Station Survey
2. Paper Based Participatory Mapping
3. Participatory Mapping and Processing - SLM
4. Field Apps with GNSS
5. AFE – Automated Feature Extraction

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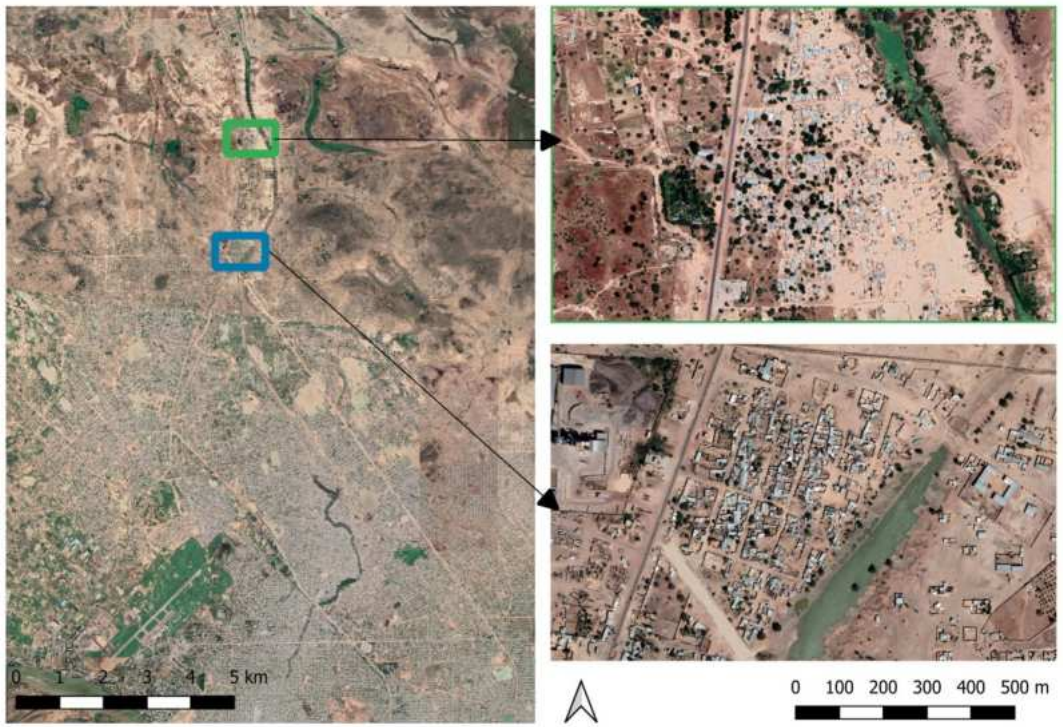
Case Study Area



Case Study Area 1:
Sadjéri Koukaye

Case Study Area 2:
Lamdji

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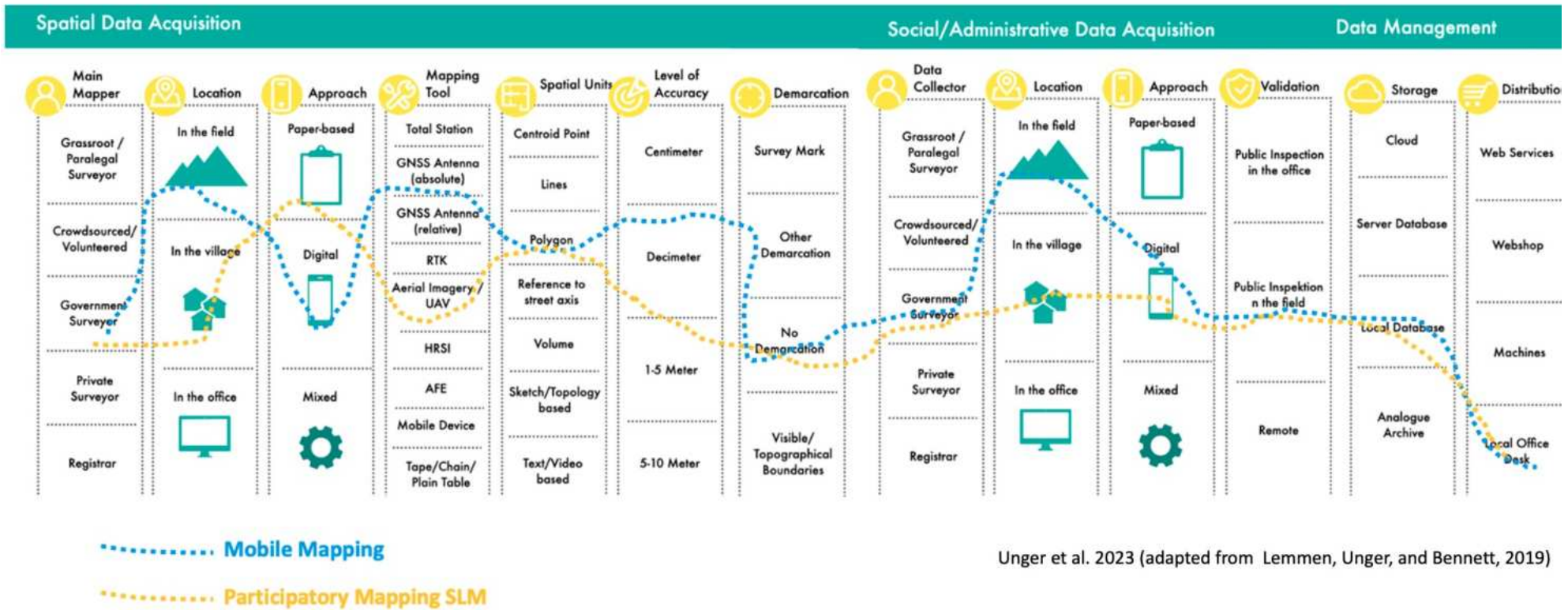
Fit-For-Purpose Land Administration



Unger et al. 2023 (adapted from Lemmen, Unger, and Bennett, 2019)

MCC LRTS

MCC Land Records and Transaction Systems Technology Toolkit (LRTS) is a joint project of Land Equity International (LEI) and the Millennium Challenge Corporation (MCC) and was developed to provide a framework for assessing and identifying appropriate technology investments specifically for land registration and transaction systems

It focuses on choosing the right level of technology, taking into account the legal and institutional context, existing state and implementation of technology and systems, and capacity and requirements for financing and financial sustainability in a given context. Once a technology decision has been made, planning, procurement and scoping modules are also part of the toolkit.

MCC LRTS and COFLAS

Both COFLAS and the LRTS Toolkit serve to improve land administration systems but differ slightly in their coverage and core area of focus.

The LRTS Toolkit is fundamentally an assessment and project design tool, incorporating key elements of COFLAS as individual tools to guide the assessments of potential costs and revenue from a land transaction system.

COFLAS, as the earlier piece of work, was intended as a tool for government staff to prepare prepare prosals for land administration system reform, and was not intended as a tool to decide the why or how of reform processes

	Reliability	Accuracy	Need to walk around the parcel	Scalability	Technical know-how
SmartLandMaps: Sketching plots	Community consensus	Medium	Not necessarily	Yes	Grassroot surveyor*
Mobile Mapping Commercial License and GNSS correction service	Consensus among neighbours	High	Yes	Yes	Grassroot surveyor*
Mobile Mapping Open Source License and GNSS correction service	Consensus among neighbours	High	Yes	Yes	Grassroot surveyor with advanced GIS skills*
Total Station	According to surveying manual but as per law mostly with consensus among neighbours	High	Yes	Yes	Surveyor

Table 1: Conceptual reliability and accuracy of various methods

	Grassroot Surveyor	Professional Surveyor
Training	• Receive training and build confidence and routine through exercising • Able to conduct training after successful completion of training from the professional surveyor	• Conduct training on methodology; identification; image preparation, interpretation and explanation; • Create spatial & cadastral intelligence within the grassroot surveyors
Planning and Preparation	• Organize when and where to conduct communication and data acquisition with the communities	• Organize local and / or national support from governmental agencies (decentralize and central approach)
Awareness	• Build Trust relation with local community	• Show support in the field through governmental representative
Validation	• Conduct validation in the field with the communities	• Train grassroot surveyors on how to conduct an inclusive and gender responsive validation in the field
Data acquisition	• Conduct field work (data collection by drawing on image or using GPS or other data acquisition method), collecting evidence on existing rights through photos of documents, photo of ID and person, • Introduce (communicate purpose and procedure) to HH • Check data in detail after acquisition	• Supervise data organization, data management, tool/hardware management, logistical arrangements • Check data on consistency • Keep the overview
Approach	• Review the approach in regard to local circumstances	• Define the approach
Tools Customization & Manuals	• Review manuals on usability • Use manuals for conducting sensitization and training	• Draft and create manuals • Use existing manual for training purposes for the grassroot surveying • Conduct tools customisation

Source (Unger et al. 2019b)

		Approx. time for input (min/days)	No. of Teams required (1)	Costs 8 software licences (EUR) (2)	Costs 8 GNSS antenna(s) with high precision subscription (2)	Costs 8 Tablets (3)	Total costs for mapping (EUR)
SmartLandMaps: Sketching plots							
	For one plot (minutes)	1.5		1			1.01
	For 50000 plots (days …. Euro)	156	1	50,000	none	500	50,500
Mobile Mapping Commercial License							
	For one plot (minutes)	15					3.918
	For 50000 plots (days …. Euro)	1,563	8	4,400	187,500		195,900
Mobile Mapping Open Source License							
	For one plot (minutes)	15					3.83
	For 50000 plots (days …. Euro)	1,563	8	none	187,500		191,500
Total Station							
	For one plot (minutes)	480					290.90
	For 50000 plots (days …. Euro)	400,000	1819		14,545,455		14,545,455

Table 2: Conceptual calculations for various methods and approaches

Some assumptions that were made for the calculation
(1) each team works a maximum of 220 days per year
(2) (2) commercial suppliers offer quantity discounts for the purchase of large quantities of licences and antennas. The table above applies only the list price, average and anonymised, per unit times the number of teams with no discount possible
(3) for the same number of teams (not necessary if teams use their smartphone)

Main Findings

Enhancing the technical implementation of land administration systems in Chad within the frameworks of COFLAS and the LRTS Toolkit offers a structured approach to addressing some of the challenges

COFLAS, with its focus on cost-efficient and sustainable land administration services, provides a valuable guide for Chad in dealing with its infrastructure challenges

By using COFLAS to analyse the costs and benefits, Chad can make informed decisions on investing in such improvements

The LRTS Toolkit, on the other hand, offers a comprehensive approach towards technology selection and project design in land administration. Its principles can guide Chad in selecting appropriate technological solutions and designing projects that are also dealing with local challenges such as unreliable electricity and internet. The toolkit's emphasis on sustainability and post-project viability is particularly relevant for Chad

Moreover, both COFLAS and the LRTS Toolkit emphasize the importance of stakeholder involvement and local capacity building. This aligns well with Chad's need to train local personnel in IT and system management, reducing reliance on external vendors and building a sustainable ecosystem for land administration