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THE VISIBLE BOUNDARY:  
MORE THAN JUST A LINE  
BETWEEN COORDINATES

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ITC

**FIG** CHAMBER OF GRADUATED SURVEYORS

**FIG Working Week**  
17 - 21 May, Bulgaria  
From the wisdom of the ages  
to the challenges of modern world


**FIG** SOFIA 2015




**LIMITS OF ONE'S PROPERTY**

- Separating interests
  - unlike other assets, land is in principal one continuum
  - to own a piece of this, it has to be separated
  - this separation between two legal interests in land is the boundary
  - one can describe it in words, but hard to understand, and even harder to verify
  - there we 'survey and map' it
  - needs an understanding of 'it', how that can be determined in the field, and how geospatially 'recorded'


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## BOUNDARY

- Easy in 'natural language',
- Hard in more formal terms.
  - different disciplines have their own take on it
- From cadastral surveying:
  - a boundary is "either the limit at law of any estate or a physical feature such as a fence erected to mark the limit at law" (Dale 1976).



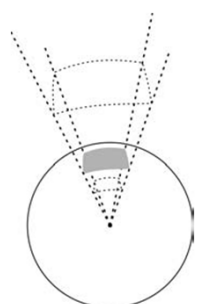
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## BOUNDARY

- A boundary is a surface that divides one property from another, which in the case of land parcels theoretically extends from the centre of the earth vertically upwards to the infinite in the sky




(Stoter 2004)




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## BOUNDARY

- In more practical terms, however, it may be defined as:
- “An imaginary line which marks the confines or line of division of one contiguous estates. The term is also used to denote the physical objects by reference to which the line of division is described as well as the line of division itself. In this sense boundaries have been divided into natural and artificial, according as such physical objects have or have not been created by the agency of man.” (Halsbury, Laws of England, 3<sup>rd</sup> Ed. Vol 3, p . 354).




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## TWO TYPES OF BOUNDARIES

- In cadastral surveying we often distinguish two types of boundaries:
  - general
    - boundary for which the precise line on the ground has not been determined
  - fixed
    - legal boundary of a property where the precise line has been agreed and recorded
- FIG/World Bank ‘Fit-for-purpose Land Administration’ publication suggest to use ‘general’ boundaries to quickly reach full coverage
- This is also disputed by others




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## LAND MANAGEMENT FUNCTIONS


- 1. Guarantee of ownership and security of tenure
- 2. Support for land and property taxation
- 3. Provide security for credit
- 4. Develop and monitor land markets
- 5. Protect land resources and support environmental monitoring
- 6. Facilitate the management of State-owned land
- 7. Reduce land disputes
- 8. Facilitate rural land reform
- 9. Improve urban planning and infrastructure development
- 10. Produce statistical data

(UNECE - LAND ADMINISTRATION IN THE UNECE REGION  
Development trends and main principles, 2005)





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## FIT-FOR-WHICH-PURPOSE ?

- At what level do boundaries need to be determined to contribute to those land management functions ?
  - Depends on circumstances, like topography, density of use, etc.
  - Many (physical) boundaries can not be determined very accurate, they have a low 'idealization precision' (cf. Baarda, see Bennett et al, Geomatica 2012 p 365-374)
    - e.g. middle or edge of ditch, at the tree, middle of the hedge (0.5 – 1 meter); corner of house (5-15 cm), ..
  - Such boundaries are "visible", esp. from aerial images
- What are the issues that require land administration ?

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## BOUNDARY ISSUES NOT NUMBER 1

What type of conflict is it?	Numbers	Percentage
Linked to inheritance	157	41.2
Eviction by gov. agency	83	21.8
Boundary	81	21.3
Eviction by private land lord	56	14.7
No response	4	1.0

Incidents of land conflicts in the Study Area (in Central Uganda) - adapted from Mabikke 2014, p 127 (PhD defended at TUM)



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## BOUNDARY ISSUES NOT NUMBER 1

- In another study 118 respondents scored among 9 tenure core functions (on a 5 point scale)
  - Lowest three:
    - cadastral survey (1.75),
    - boundary monuments (2.16) and
    - parcel and index maps (2.34)
    - ..
    - updating (3.25)
    - adjudication (3.54)
    - ..
  - Shibeshi, G B; 2014 (PhD at BOKU, Vienna)



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## BOUNDARY ISSUES NOT NUMBER 1


- In a list of dispute resolved over 7 years, only for 2 years 'boundary disputes' were mentioned, and still combined with other issues:
  - double sales, abuse of fiduciary role, trespassing, farmland encroachment
  - 90% of conflicts linked to the double sales

(Data form Wa Central Customary Lands Secretariat; see Biitir, S.B., Nara, B.B., Africa Geospatial Forum, Lagos 2014; [http://africageospatialforum.org/pdf/SamuelB\\_Biiti.pdf](http://africageospatialforum.org/pdf/SamuelB_Biiti.pdf))



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## WAY FORWARD ?

- 'boundary' is a multifaceted term
- to identify plots/parcels/.. and to prevent double sales, make land use plans, etc. we can go with what we see – **visible** boundaries
- idealization precision of non-buildings is half a meter a best
- aerial images are getting to that accuracy as well
- 70% of land not yet cadastrally mapped
- so many areas FFP suggestions can work
- however, it all depends on the purpose, but let us not oversell the technological possibilities

- Coverage first, additional accuracy later



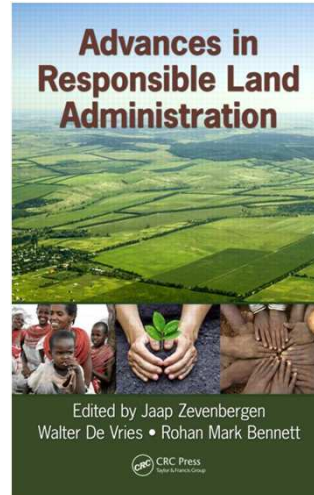
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## THANKS FOR LISTENING

- More academic overview of developments in land administration, coming out in August 2015



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