
Potential use of LADM in cadastral data-management in India

Anandita SENGUPTA (India),
Debanjan BANDYOPADHYAY (India),
Christiaan LEMMEN (The Netherlands) and
Anne VAN DER VEEN (The Netherlands)



The availability of a digital, up-to-date, complete and easy accessible cadastral database has become a basis for undertaking developmental planning decisions for many countries



The Concerns

- Cadastral maps are dynamic and must reflect the daily changes
- Many countries have conceptualized the framework of digital cadastral database (DCDB)
- India is yet to reach a position of competence
- In India, the existing land administration system is a British legacy
- Colonial cadastral maps available today are mostly outdated
- Re-survey is expensive and time consuming

- No solid basis for spatial planning



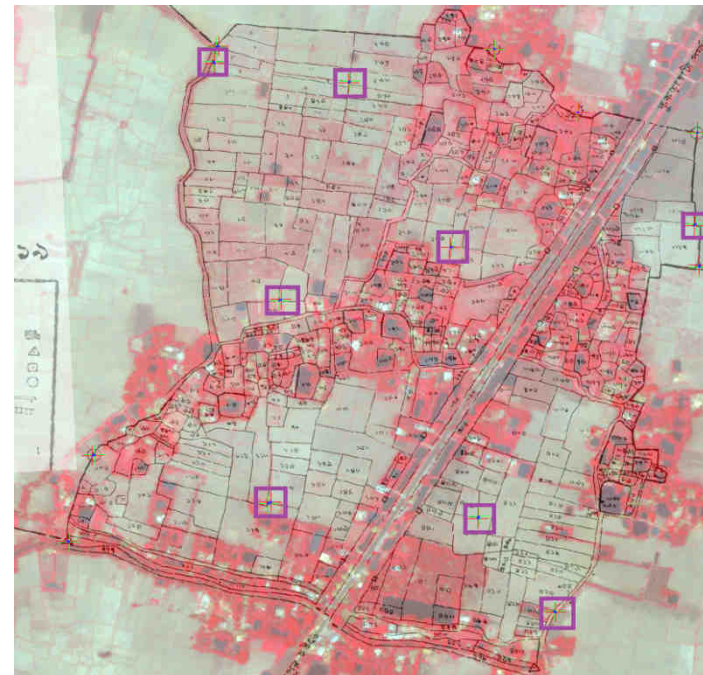
Cadastral mapping in West Bengal

- The unit of survey for cadastral mapping and land records is a mouza (i.e. revenue village)
- Survey principle of ‘from whole to part’:
 - boundary of the mouza under survey was first subjected to theodolite traverse
 - ground details were surveyed and plotted by plane table or chain survey
- The best information available as basis for spatial planning



Approach in digitizing cadastral map

- Scanning of the paper-based cadastral maps
- Geo-referencing them with respect to the VHR imagery
- For each maps, 10 to 15 identical points both on image and scanned cadastral maps were used as ‘control points’

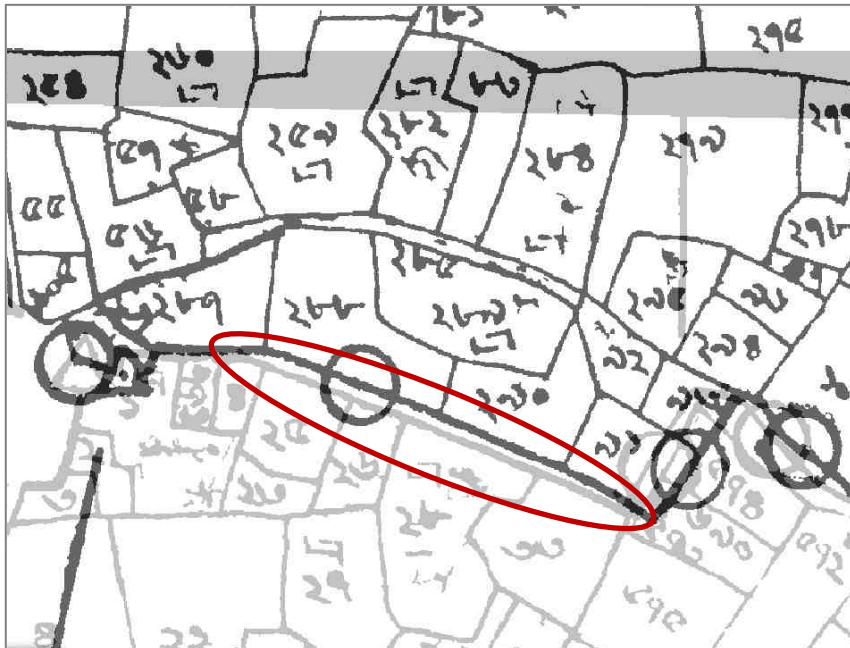


Approach (cont....)

- Boundaries of the geo-referenced maps were digitized in a polygon layer by matching the edge of the adjoining sheets
- Parcel layers were merged to seamless cadastral-level parcel layer
- 326 sq. km. Geo-Eye1 merged data was used for this purpose in combination with paper-based cadastral maps and limited on-site surveys
- Registers were computerised



Issues related to digitization



Issues related to digitization



Issues related to digitization

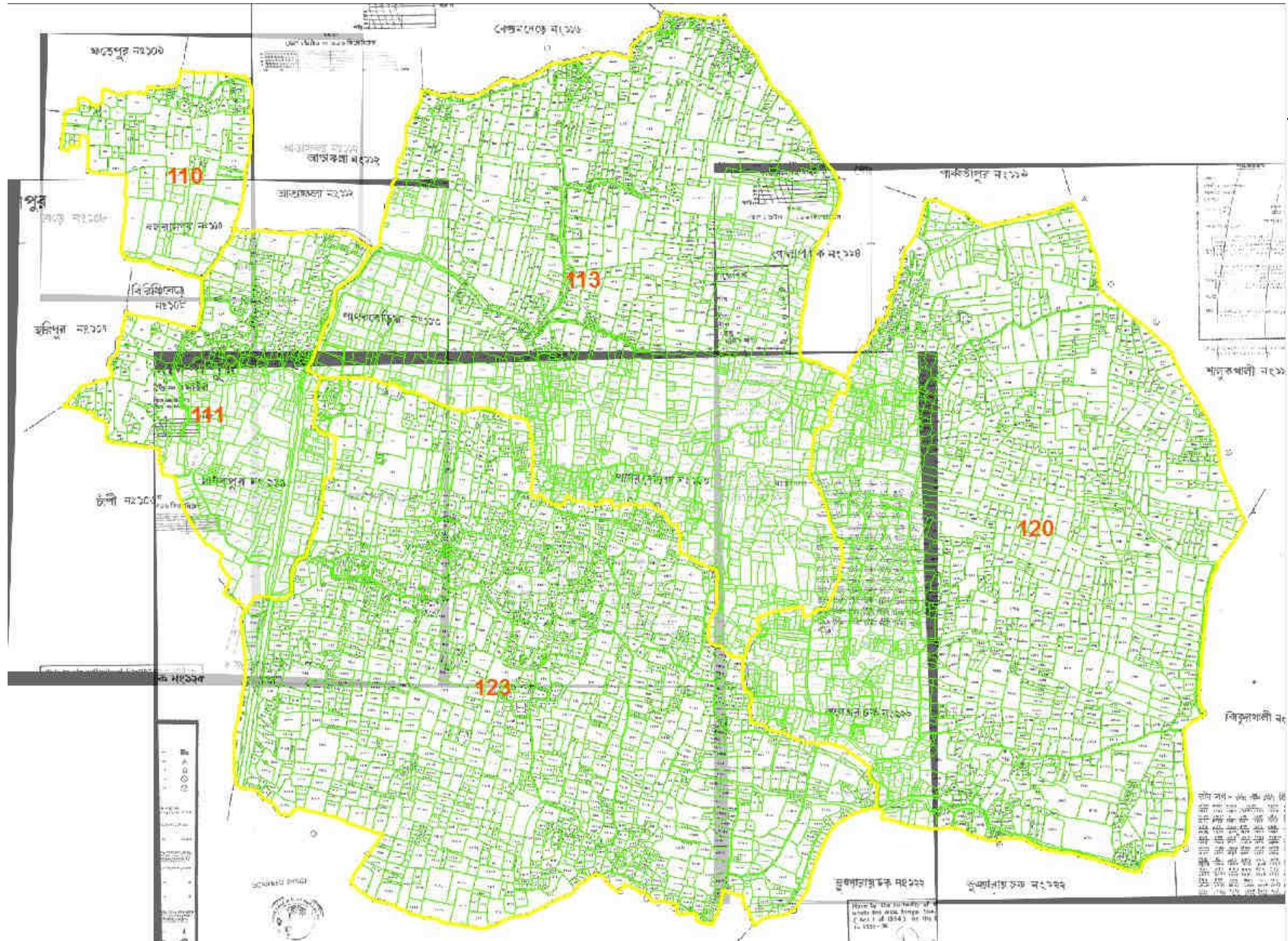


Mouza	DLRS record	Without adjustment	With adjustment
A	314.24	321.81	316.73
B	286.38	289.27	286.16

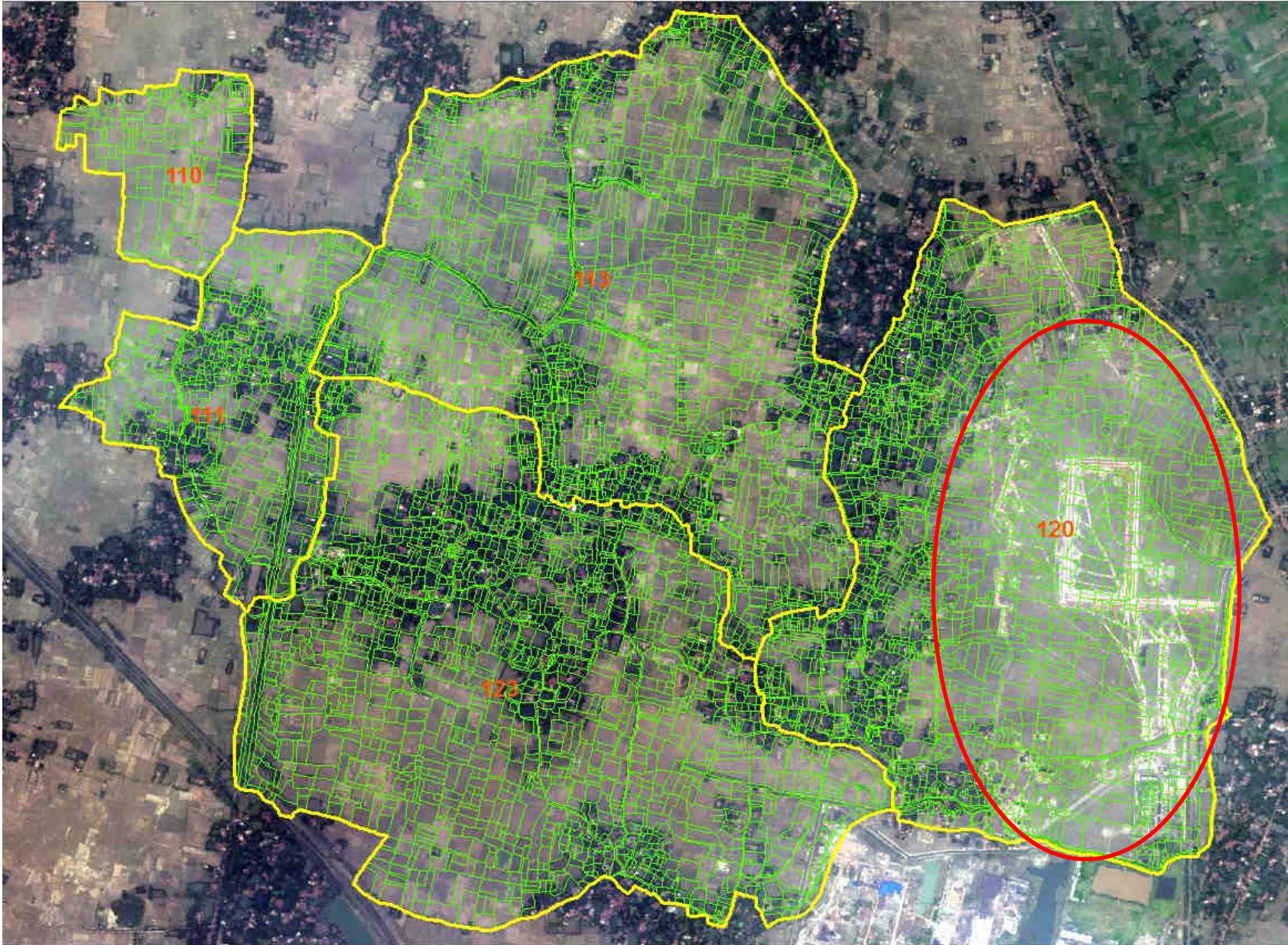
Issues related to scanning & storage



Digital cadaster of Haldia



Updation of digital cadaster



Highlights

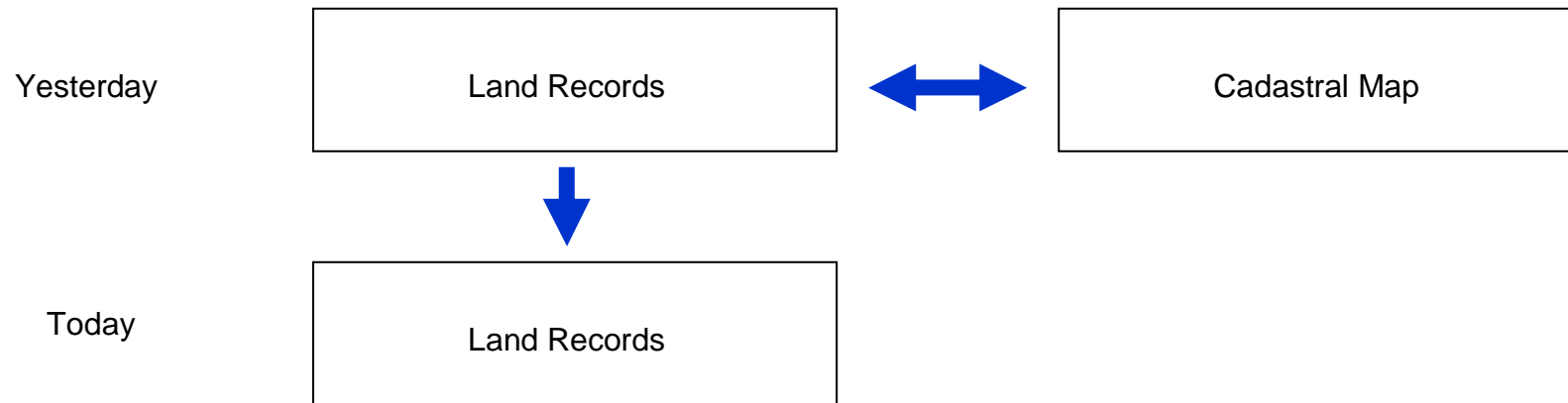
- Application of GIS techniques for preparing a digital cadastral map for a sufficiently large area
- Cost-effective methodology
- Requires minimal field survey
- Basis for monitoring the changes in land use across parcels after acquisition, breaking down or consolidation
- Can be used with any other spatial datasets



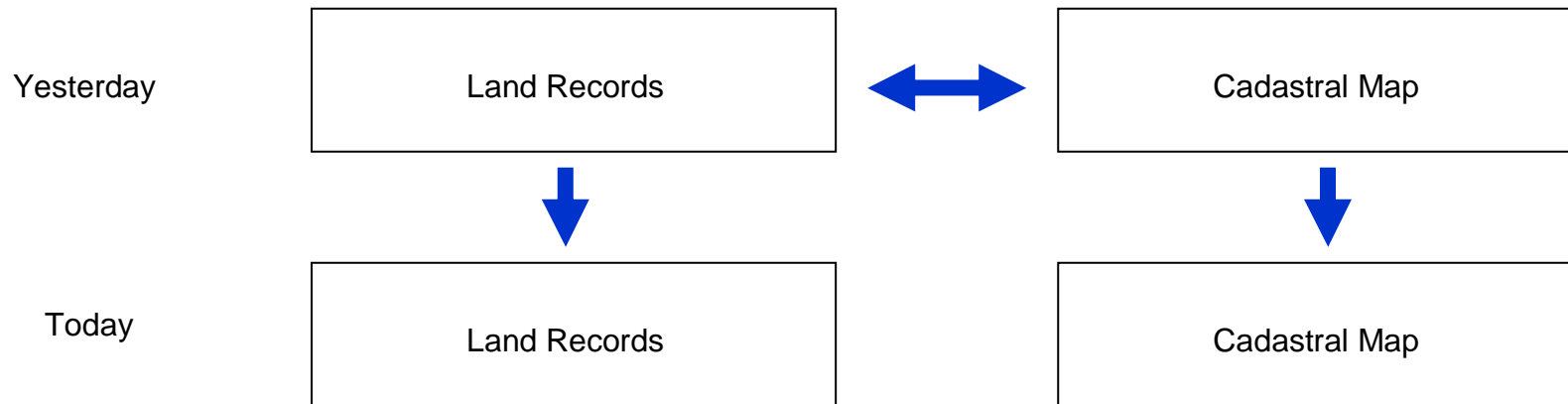
Yesterday - Past



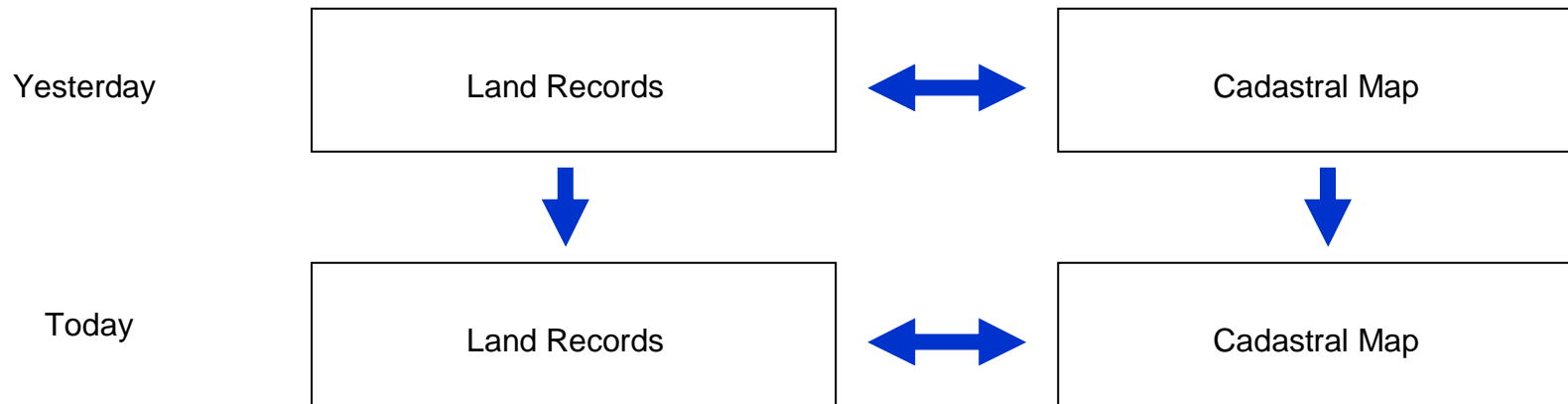
Updates: only the reocods



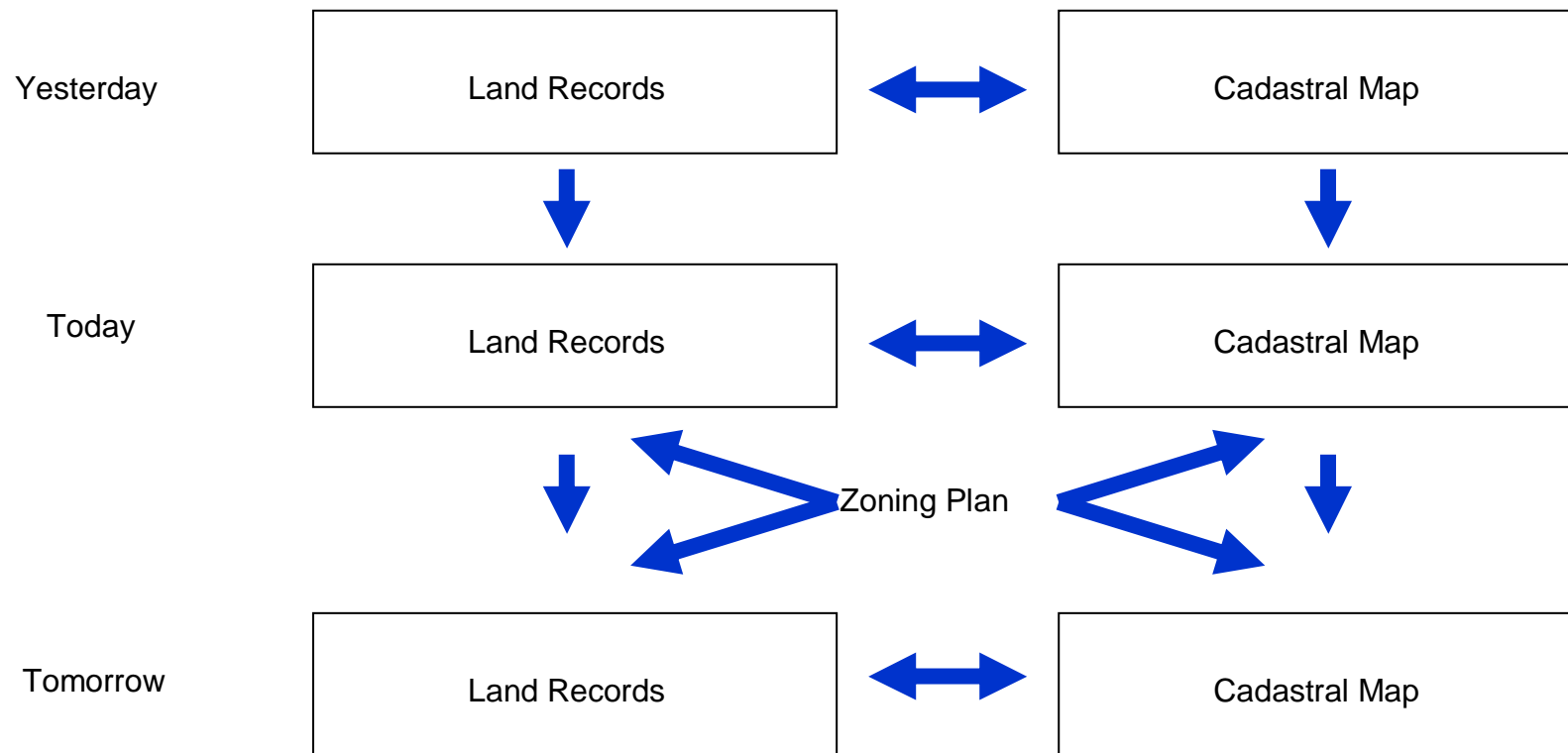
Updates: Maps not maintained – Imagery and known transactions



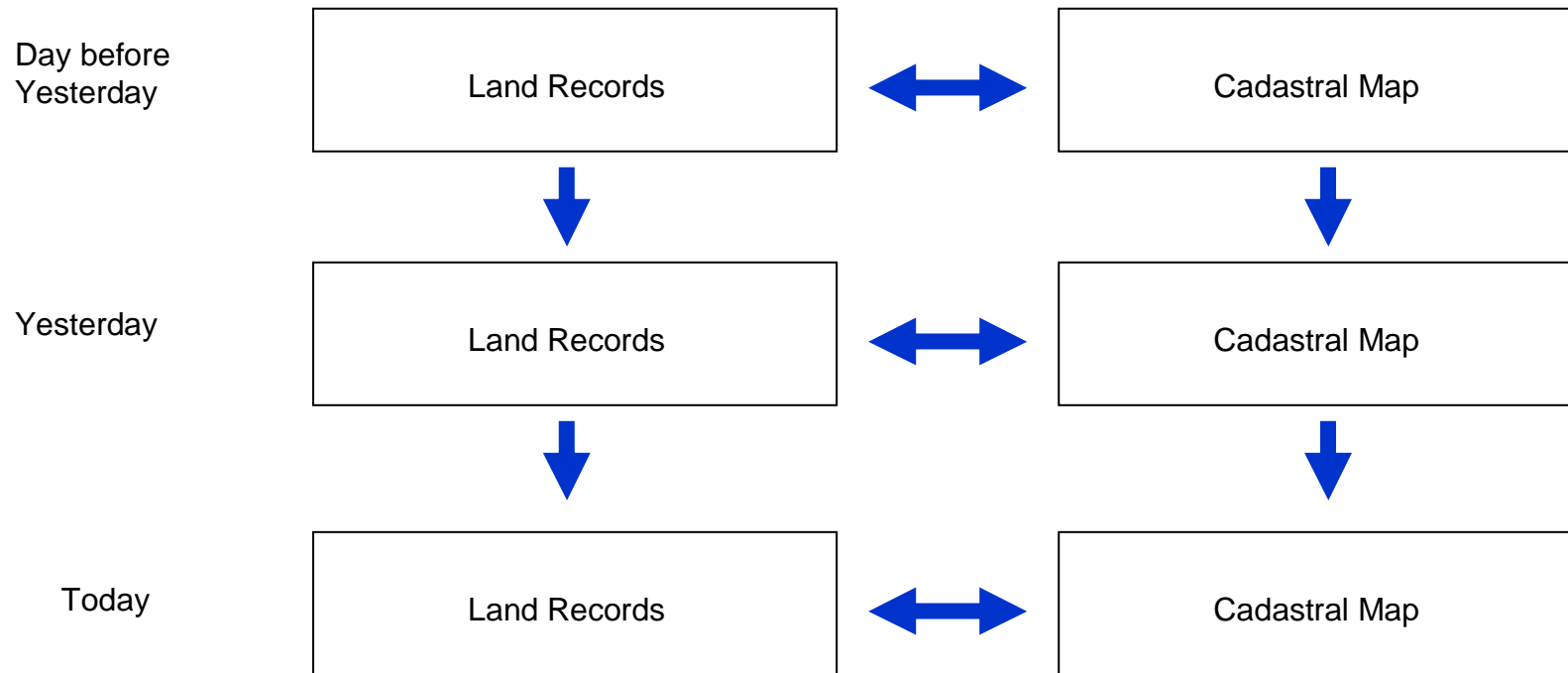
Updates: Checking and Linking



Basis for spatial planning



Updates: Checking and Linking



LADM

- Reconstruction of ‘spatial transactions’: documentation of history
- Roles
- Area management
- Checks on completeness
- Quality labeling
- Versioning - history





Thank you!

*For more information:
sengupta15552@itc.nl*



UNIVERSITY OF TWENTE.