

**SMART SURVEYORS FOR LAND AND WATER MANAGEMENT**  
**CHALLENGES IN A NEW REALITY**



**e**WORKING WEEK 2021  
**20-25 JUNE**

**Raja Ram Chhatkuli, Janak Raj Joshi, Jagat Deuja and Uma Shankar Panday (Nepal)**

Paper ID-11130

**Participatory Mapping as a Smart Survey Tool to Support Land Rights for All: Experiences and Expectations (Nepal)**

Session date, time: Tuesday, 22 June, 08:00–09:30 CET

ORGANISED BY

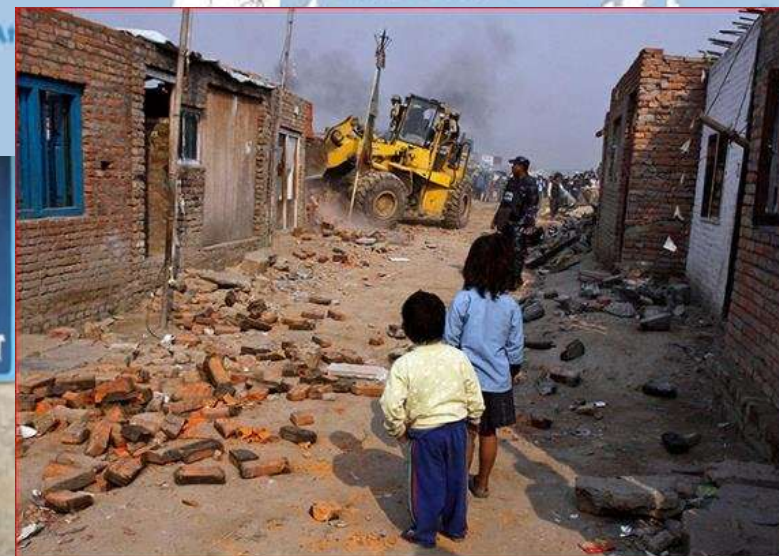


PLATINUM SPONSORS



## Country Context

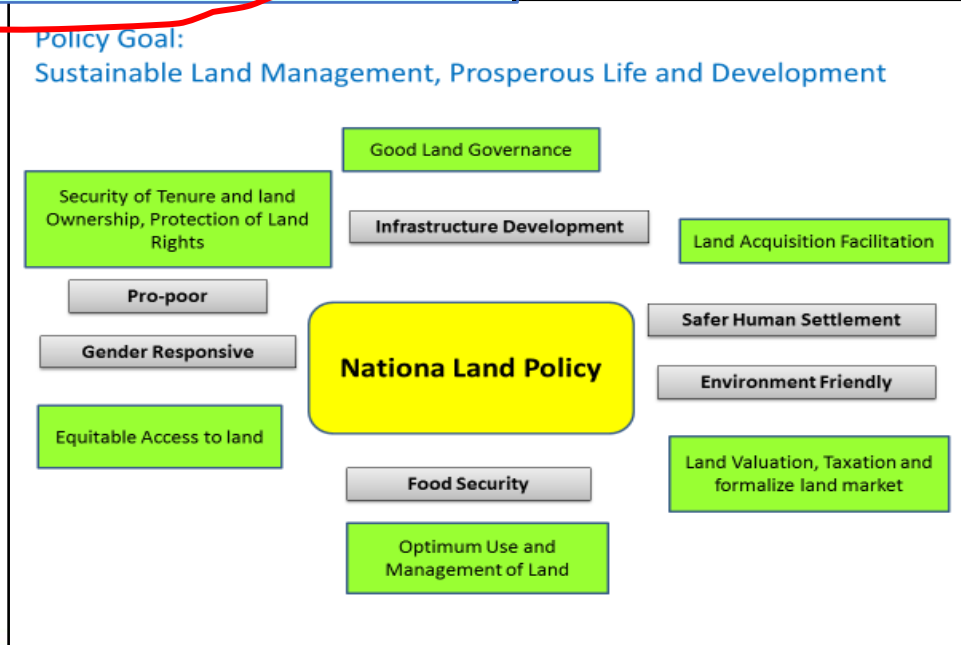
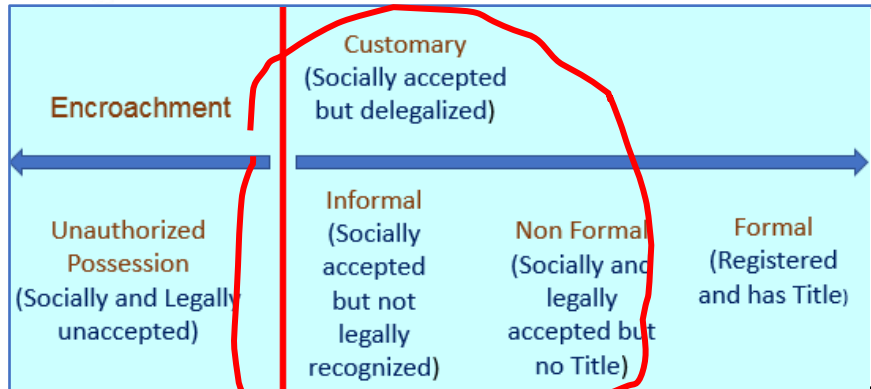
- Mountainous Country in the Himalayas
- 29 Million population/ 5.8 Million HHs
- 60% population engaged in agriculture; contribution to GDP 1/3<sup>rd</sup>
- About 45% of rural Households landless or near landless owning less than 0.5 ha
- No official record of landless and informal tenure holders
- Land administration based on cadstral maps and land registry
- 25% land/ 10 Million parcels/ 1.34 Million HHs estimated “landless and informal settlements” operating land under informal tenure; unsecured tenure, fear of eviction .







## Interventions towards Land Rights for All



- Constitution of Nepal (Right to Safe Housing, Right to Food, Land to SED people, Land Reform, Land Use Planning, Gender Responsive-ness, Good Governance)
- National Land Policy, 2019 (Recognition of informal land tenure)
- 8<sup>th</sup> Amendment (2020) to Land Act and 18<sup>th</sup> Amendment (2020) to Land Rules (Allocate land to the landless and regularization of informal land tenure holdings up-to designated size)
- Formulation of Land Issues Resolving Commission, 2020 (Implement provisions of the Land Act) with a mandate of 3 to 5 years
- Strong political will- technical challenges
- Need for smart, fit-for-purpose tools for surveying and land administration to support tenure security for all



## History of Land Surveying in Nepal

- Land administration history since 5<sup>th</sup> Century
- Jayasthiti Malla (1382- 1395)- land measurement based on productivity
- 1907- Standard measurement units (Ropani 5476 sft and Bigha 72900 sft)
- Surveying techniques
  - *Dekh Jaanch* Eye estimates
  - 1923- Chain, magnetic compass and plane tabling
  - 1964- Land Reform Programme, Systematic Survey using plane tables and telescopic alidades
  - 1969- Establishment of Geodetic Survey Branch- initiation of survey control network
  - 1964- Half the country without control and remaining with geodetic survey control network
  - 2005- Digital cadastral survey with GPS and Total Station tools
- History of evolution of Fit-For-Purpose tools and techniques

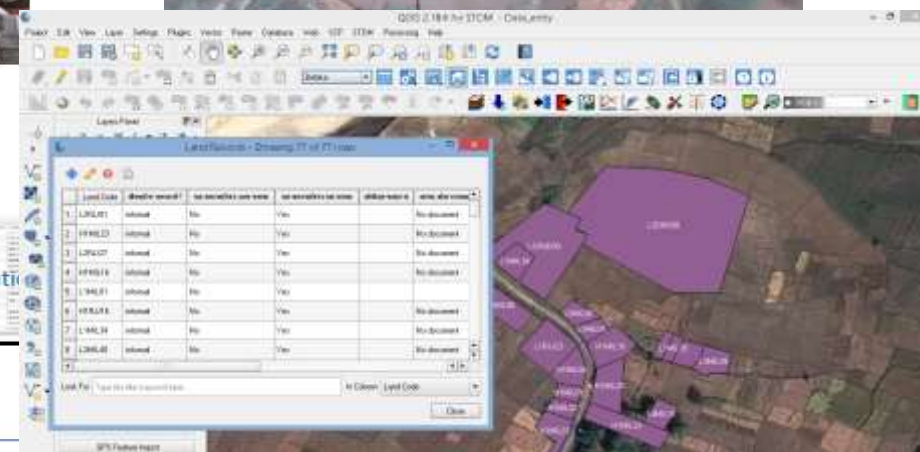
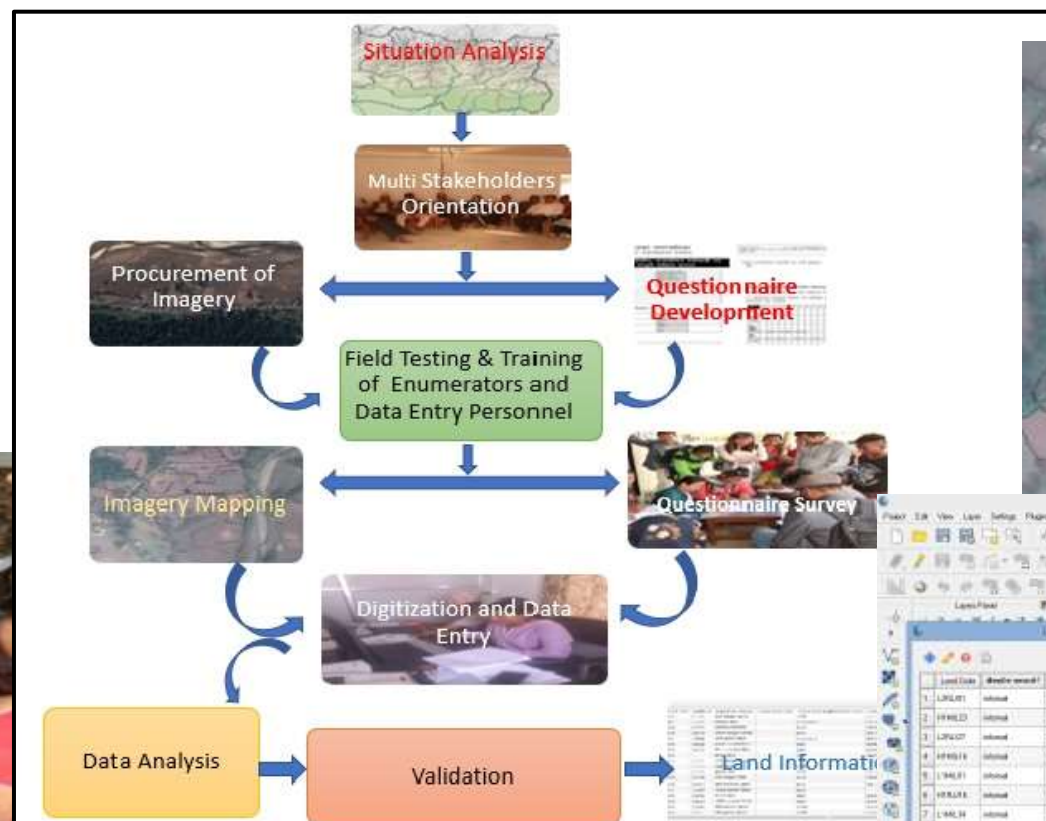
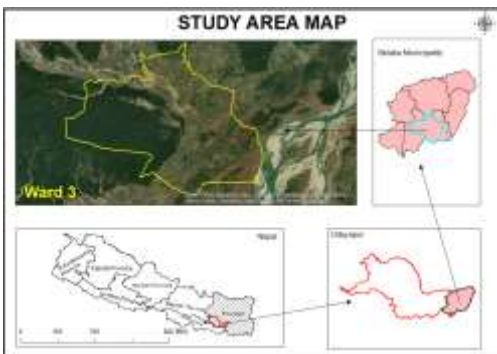


## Fit-For-Purpose Tools in the New Context





## Testing of Participatory Mapping Tool for IVR of Landless and Informal Tenure

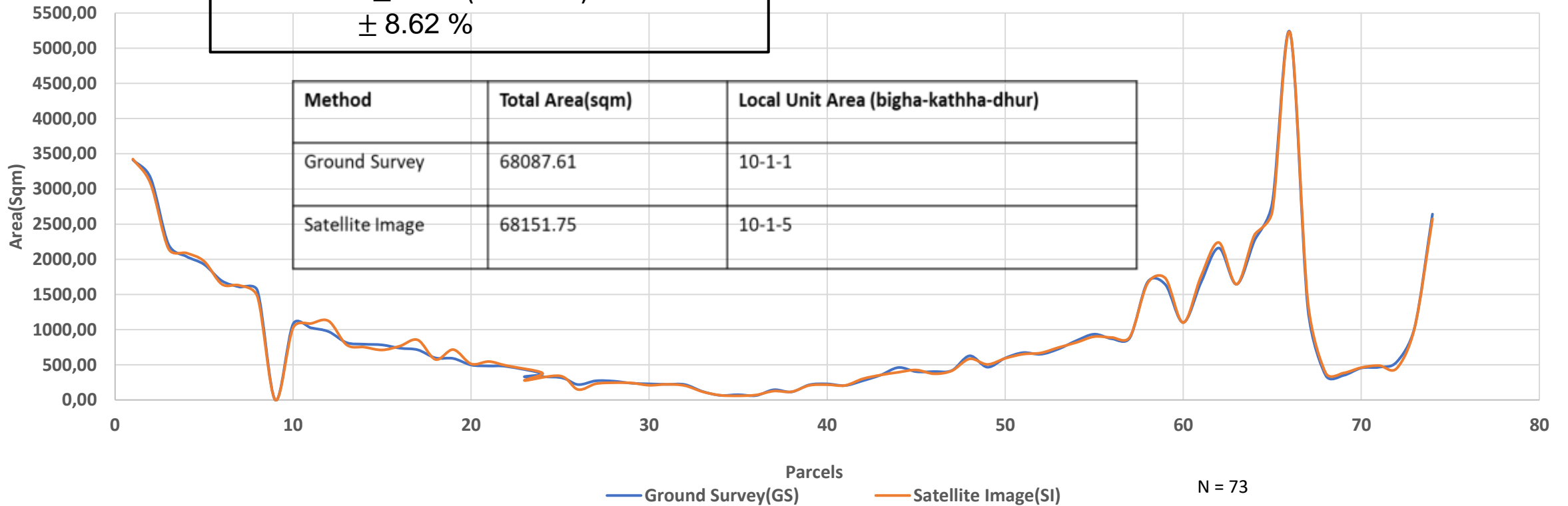




## Comparison of Ground Survey and Participatory Mapping with Satellite Imagery

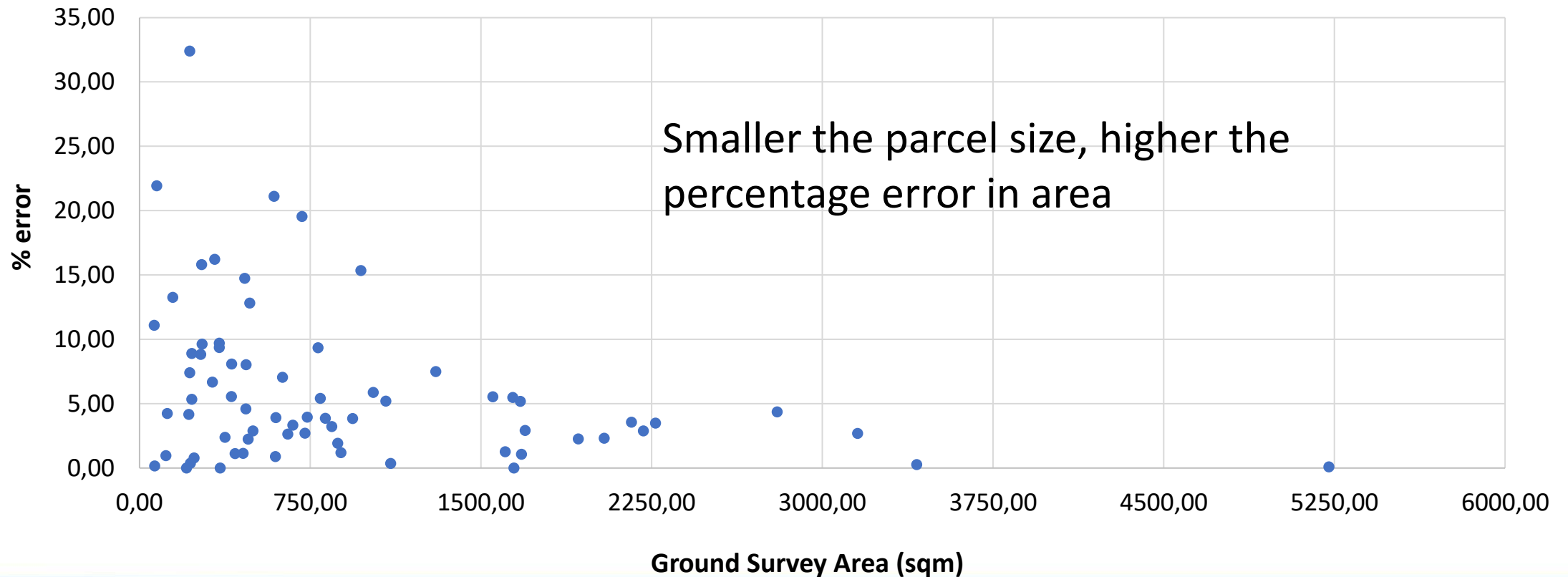
RMSE=  $\pm 52.190$  Sqm  
 =  $\pm 0-0-3$  (local unit)  
 $\pm 8.62$  %

Area Comparison (GS Vs SI)





% Error comparison wrt to Ground Survey Area







## Conclusions and Recommendations

- Participatory mapping using rectified satellite imagery may be used as an alternative to traditional survey techniques for survey of relatively larger parcels
- Is an easy and faster survey tool, using ‘grassroot Surveyors’ under supervision of qualified land surveyor
- History of land surveying in Nepal is a history of FFP approach, FFP approach in a new set up is recommended with the use of Participatory Mapping tools applying hybrid techniques



## Thank you for your Kind Attention!

Raja Ram Chhatkuli, UN-Habitat

Janak Raj Joshi, Ministry of Land Management, Cooperatives and Poverty Alleviation

Jagat Deuja, Land Issues Resolving Commission

Uma Shankar Panday, Kathmandu University

(Nepal)