



Land Use and Land Cover mapping for cultural heritage management & monitoring



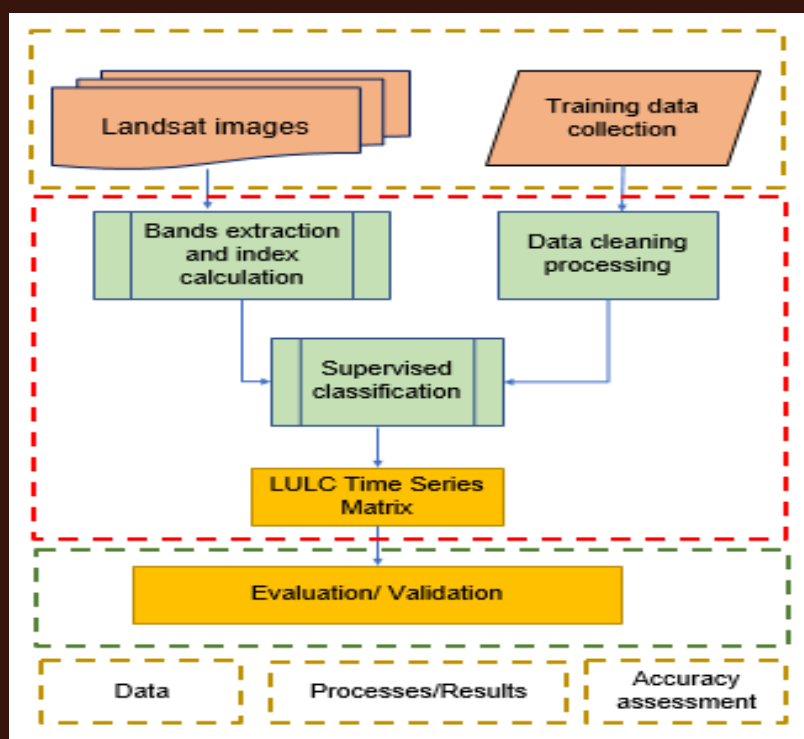
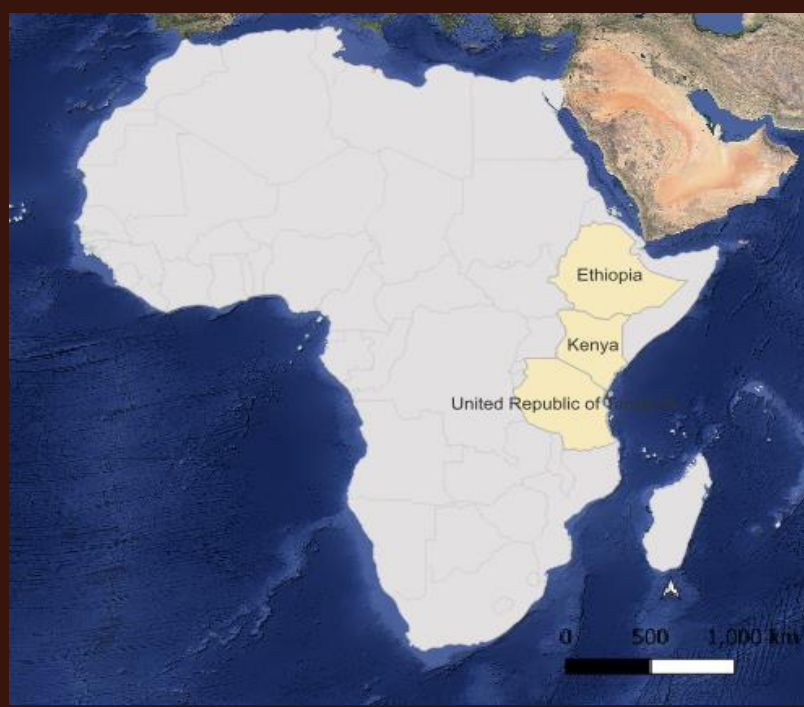
Poster created by
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Land Use and Land Cover (LULC) analysis is a critical tool for monitoring and preserving heritage sites in Kenya. These sites, which hold immense cultural and historical value, are increasingly threatened by environmental changes and human activities such as urbanization, agriculture, and deforestation. By employing advanced remote sensing techniques, we can effectively track these changes over time, providing essential data for the sustainable management and protection of Africa's rich heritage. This poster highlights key LULC activities undertaken to monitor environmental impacts and human-induced alterations at various heritage sites across the continent.

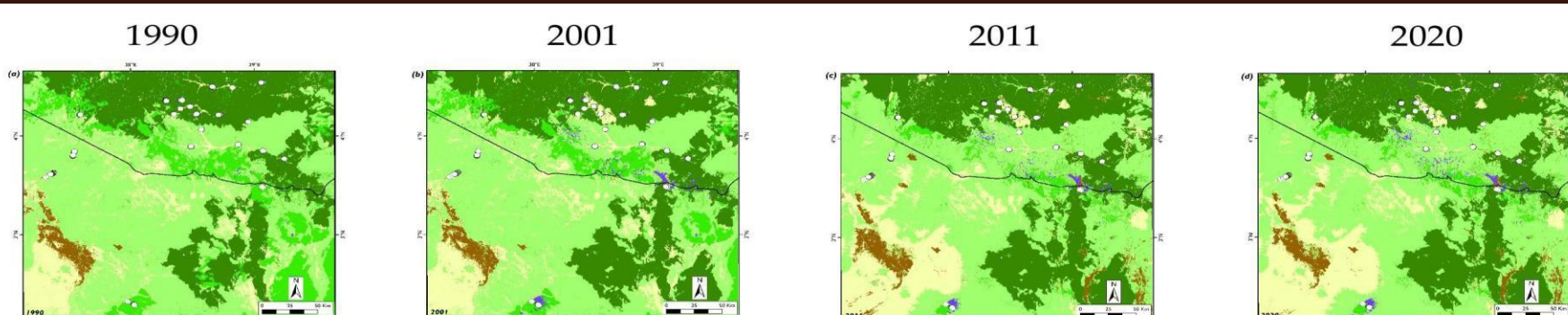
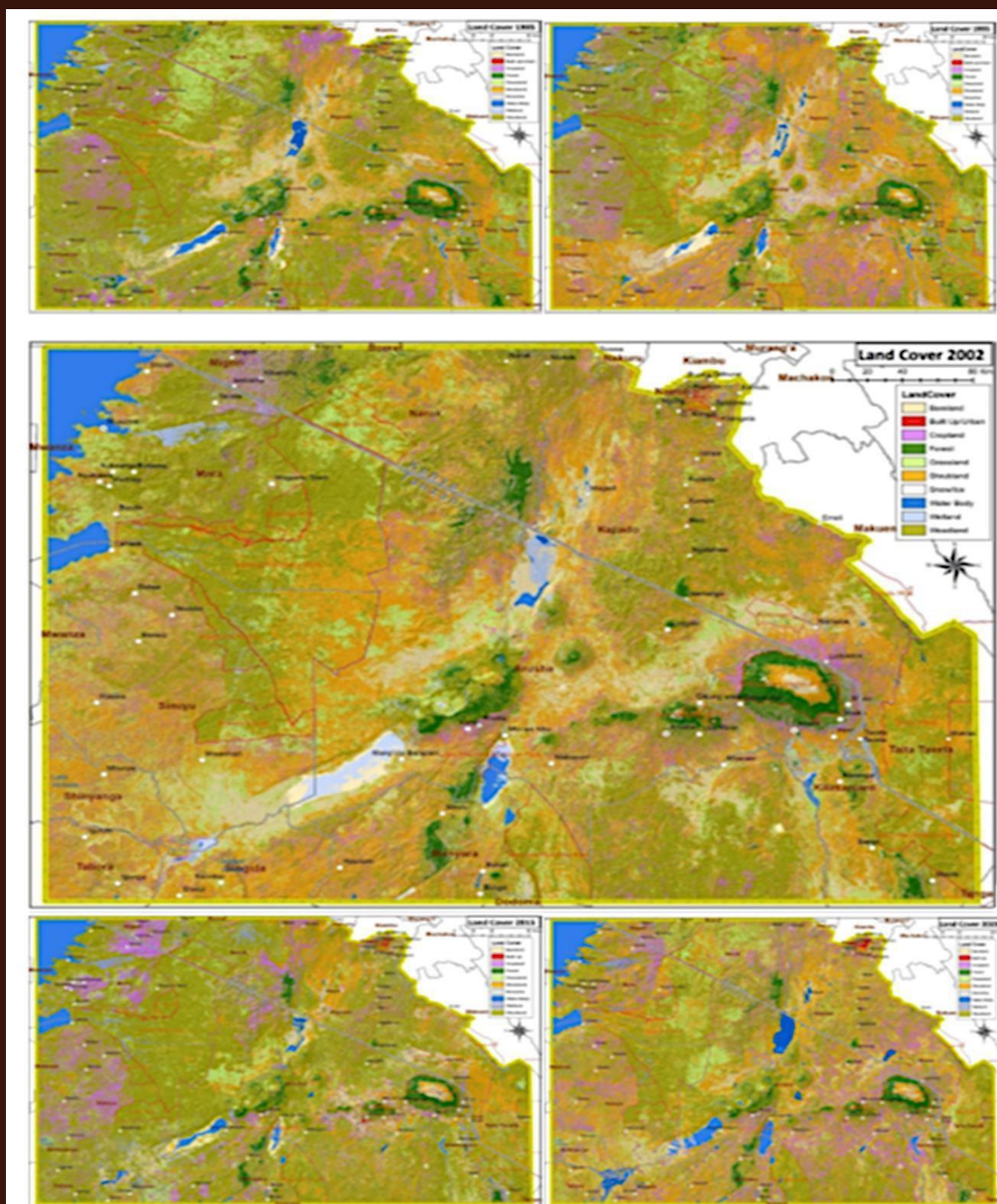
Wellbeing Project

The Borana region of Southern Ethiopia and Marsabit in Northern Kenya face erratic rainfall, aridity, and frequent droughts. Indigenous water management systems, including deep wells, are vital but increasingly threatened by climate change, population growth, and development. This study assessed land-use land-cover (LULC) and precipitation changes from 1990 to 2020 using multitemporal Landsat imagery and Random Forest classification. Results revealed significant anthropogenic-driven land cover changes and fragmentation near well clusters, highlighting the impact on traditional water systems. Remote sensing proved effective in assessing the preservation status of these indigenous wells.

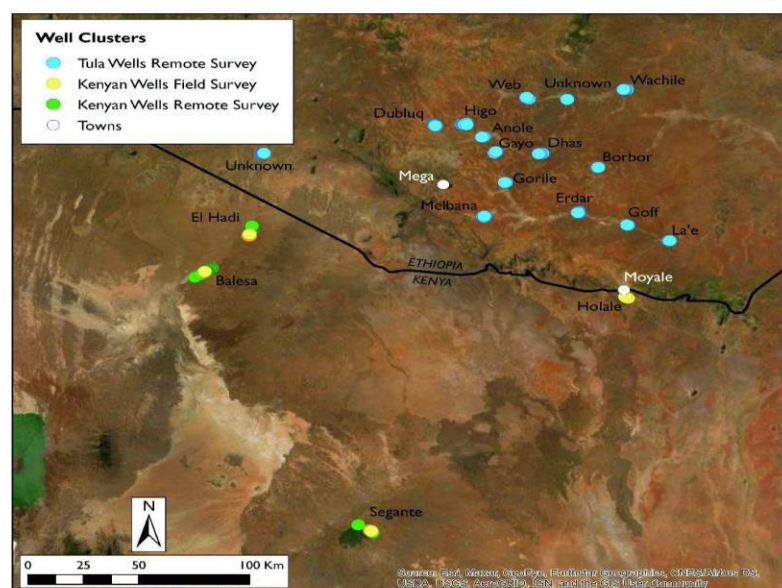


ARCC Project

This study focuses on the South Kenya and North Tanzania region, employing extensive satellite imagery and advanced methodologies to assess land cover changes. The study is driven by the recognition of human-induced environmental challenges impacting landscapes and the need for sustainable resource management in the light of climate change.



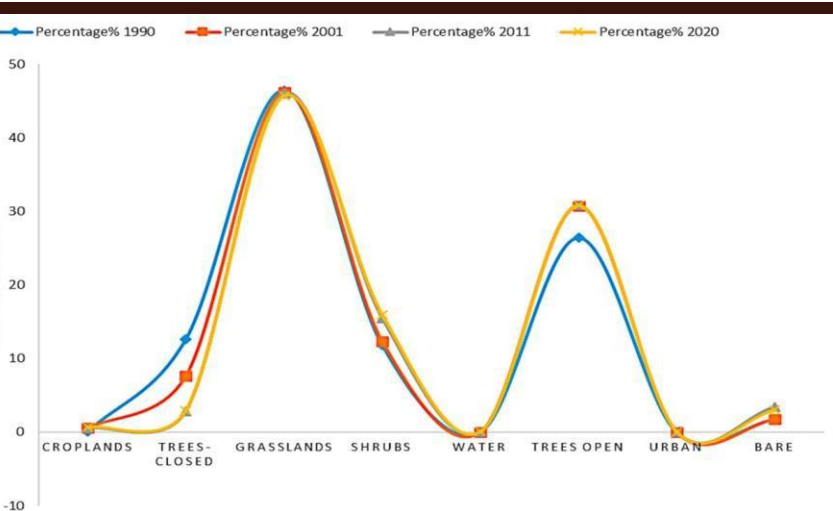
Land-Use Land-Cover (LULC) mapping



Distribution of wells



Wells in action



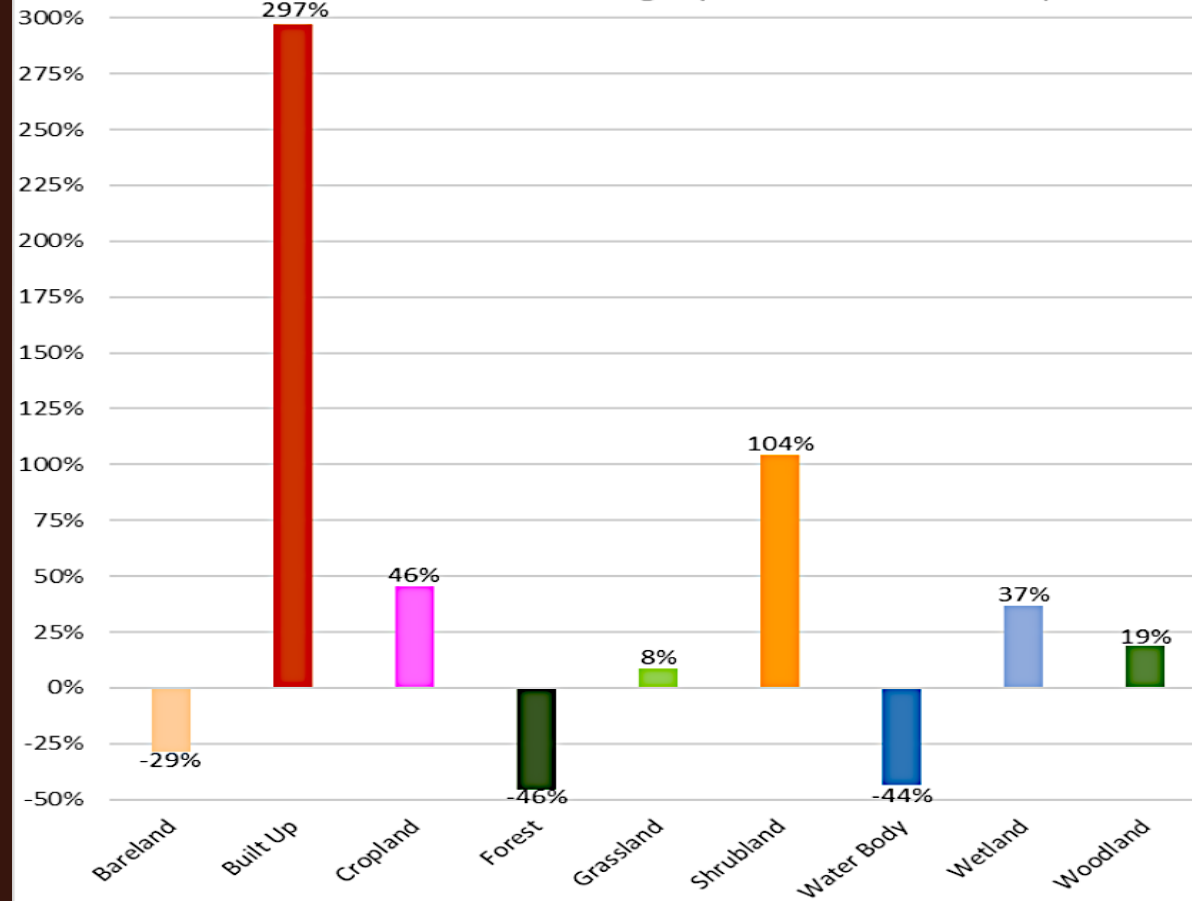
Line graph (Wellbeing Project)

- **Urban Areas:** There is a noticeable increase in the percentage of urban areas from 1990 to 2020. This indicates urbanization or development over the years.
- **Trees-Closed:** The percentage of closed tree cover shows a steady decrease from 1990 to 2020, indicating deforestation or land conversion activities.

Bar graph (ARCC Project)

- The highest increase is seen in urban areas with a 297% increase, followed by shrub land (104%).
- Significant decreases are observed in forest (-46%) and water bodies (-44%).
- This graph highlights substantial urbanization and land use shifts over the 35-year period

Land Cover Area Change (Year 1985 to 2020)



1. Ochungo, P.; Khalaf, N.; Merlo, S.; Beldados, A.; M'Mbogori, F.N.; Tiki, W.; Lane, P.J. Remote Sensing for Biocultural Heritage Preservation in an African Semi-Arid Region: A Case Study of Indigenous Wells in Northern Kenya and Southern Ethiopia. Remote Sens. 2022, 14, 314. <https://doi.org/10.3390/rs14020314>

2. Peter Mwangi, Pamela Ochungo, Rob Marchant, Rebecca Kariuki, Paul Lane. Adaptation and Resilience in Climate Change Project (ARCC) Land Cover and Land Use Mapping and Change Analysis In South of Kenya and North of Tanzania – Unpublished report.

To explore more of the project, check out our website at maeasam.org Or sign up for our newsletter using this QR code:

