



Promoting Cooperative Solutions for Space Sustainability

# USING EARTH OBSERVATION DATA TO HELP ACHIEVE THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

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# Sustainable Development Goals

*Space contributing to sustainable development*

- Millennium Development Goals

- In effect from 2000-2015
- Successful at focusing attention and encouraging action



- Sustainable Development Goals

- Renewed interest
- ICTs seen as key resource
- Variety of actors & industries



*How can remote sensing and geospatial technologies help?*

## SUSTAINABLE DEVELOPMENT GOALS



Signatories agreed to “promote transparent and accountable scaling-up of appropriate public-private cooperation to exploit the contribution to be made by a wide range of data, including earth observation and geo-spatial information.”<sup>1</sup>



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# Earth Observation Technology & Data

## *Why this technology?*

- Low or high resolution imagery
  - Combined with GPS, GIS
- Changing industry and capabilities
- Accessing difficult areas
- Common use cases
  - Disaster management, agriculture, climate change
- Broadening use cases
  - Endless possibilities



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# International Development

*Primary “industry” focused on assisting the developing world*

- What is it?
  - Long-term solutions to problems by working to improve economic, political and social systems in sustainable way
- How is it carried out?
  - Project lifecycle: planning, implementation, monitoring & evaluation
- Who are the stakeholders?
  - Governmental organizations, intergovernmental/multi-lateral/regional organizations, private donor entities, non-governmental organizations, contracting companies, developing country governments, space agencies, manufacturers and operators

# Community Mapping Initiative

*Combining Earth imagery with GIS and GPS technologies and local field data*

- Supports SDGs: 1, 2, 3, 4, 5, 6, 7, 10, 11
- Dar Ramani Huria project in Dar es Salaam, Tanzania
- Successful project with demonstrated results
- Takeaways
  - Multi-stakeholder nature
  - Mapping supports a wide variety of small-scale projects across many SDGs



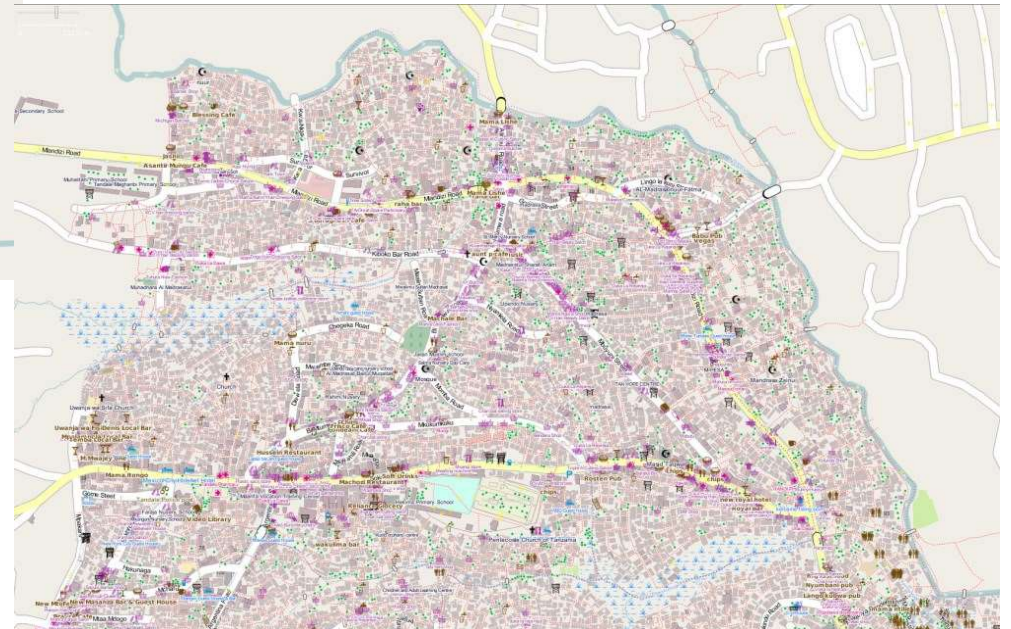


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# Community Mapping Initiative



Tandale ward before and after mapping



# Small-Scale Forest Monitoring

*Applying digital change detection techniques to small-scale projects*

- Supports SDGs: 2, 15, 16
- Semi-automatic detection techniques to ascertain illegal charcoal production sites in Somalia
- Normalized Difference Vegetation Index (NDVI) methodology to assess projects in rural Tanzania
- Takeaways
  - Cross-cutting data
  - Area coverage
  - Planning and evaluation

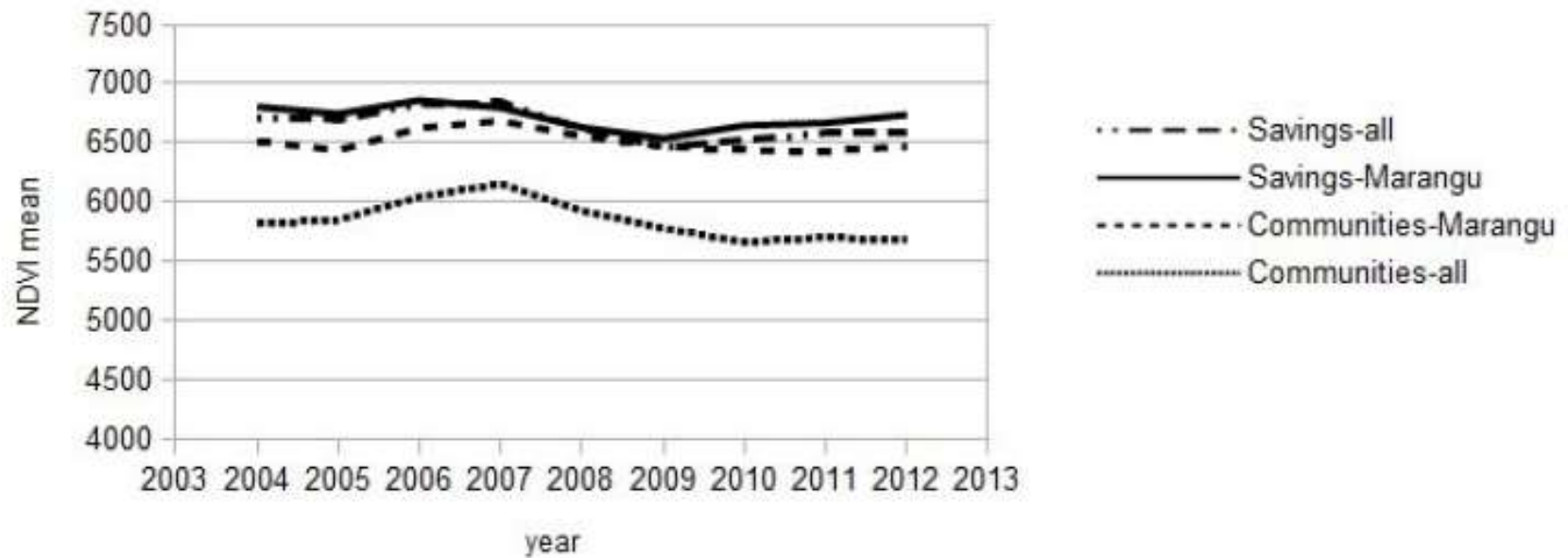




## Analysis of Tanzania data

Figure 3: NDVI annual mean

based on rolling averages



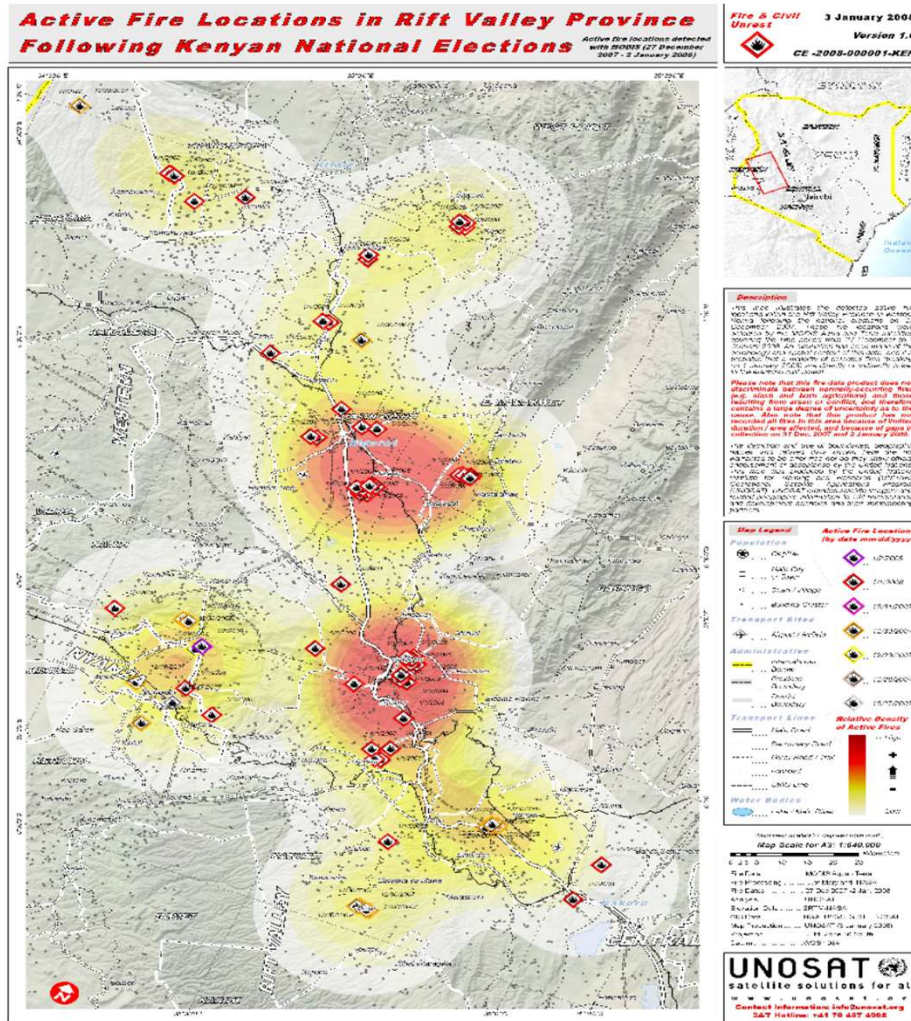
Source: Morikawa<sup>3</sup>

## *Using remote sensing in elections projects*

- Supports SDG: 10, 16
- Potential for application at every stage of project lifecycle
- Support for free and fair elections
- Takeaways
  - Donor reluctance
  - Cost and specialized knowledge



# Results: Kenyan Elections 208

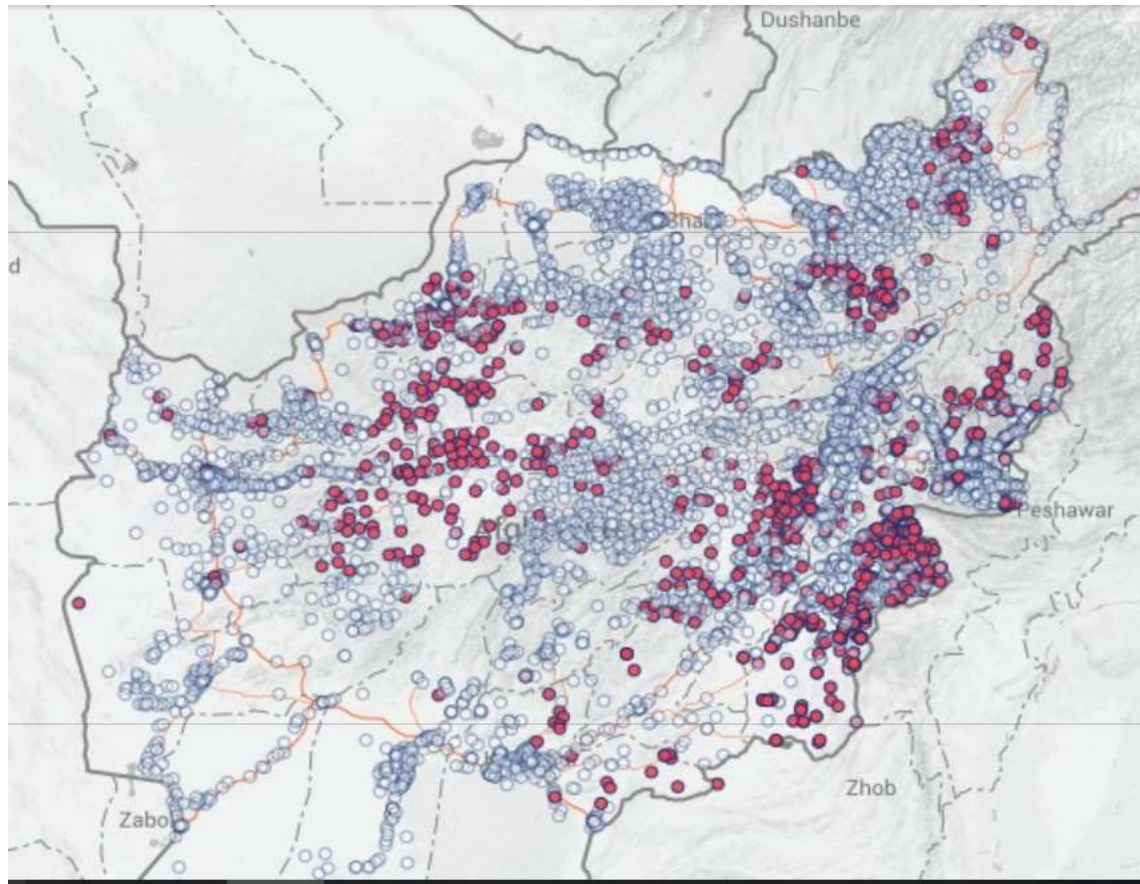


## Fire Mapping Locations

Source: UNOSAT<sup>4</sup>

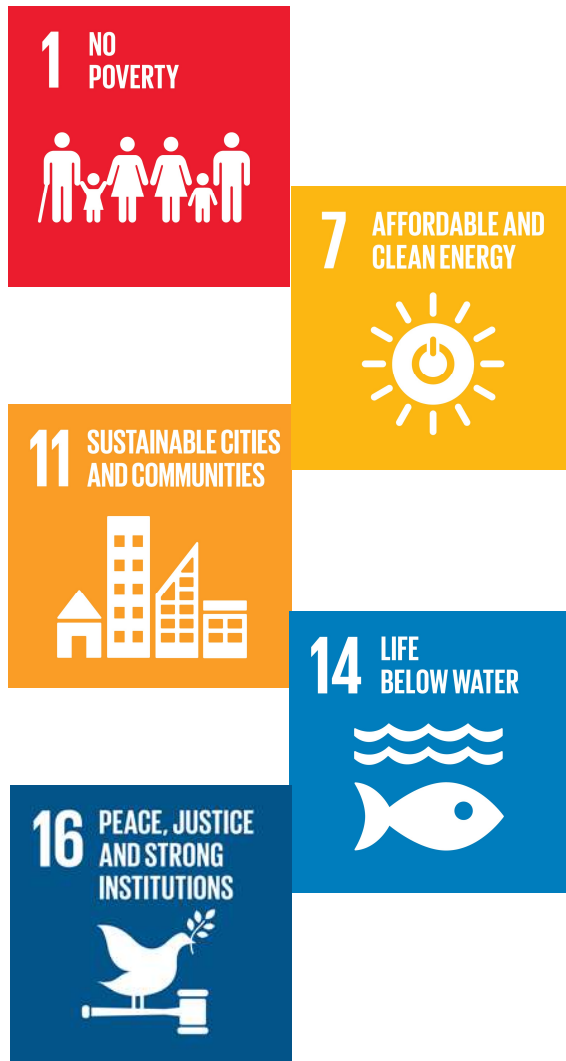
# Results: Afghanistan Elections 2014

## Location of audited polling stations



Source: Afghanistan Open Data Project<sup>5</sup>

## Additional Case Studies



- Poverty mapping using satellites images
- Planning for electric micro-grids
- Protecting cultural heritage sites
- Illegal fishing
- Human rights monitoring



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## Challenges & Barriers

*Efforts are underway in each category but difficulties remain*

- Cost and licensing
- Technical capacity
- Limits of data
- Donor skepticism
- Privacy concerns

*How can these constraints be further reduced?*



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# Secure World Foundation

Secure World Foundation *is a private operating foundation* that promotes cooperative solutions for space sustainability

- **Our vision:** The secure, sustainable and peaceful uses of outer space contributing to global stability and benefits on Earth
- **Our mission:** To work with governments, industry, international organizations, and civil society to develop and promote ideas and actions to achieve the secure, sustainable, and peaceful uses of outer space benefiting Earth and all its peoples



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**Questions?**

**Thanks.**

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