

Implementing Charcoal Production Site Monitoring Service for Ghana

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SERVIR  **WEST AFRICA**



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The service planning approach.....

National Consultation



Handwritten notes on a piece of paper, including the phrase "Improved charcoal production information in W Bamba district Land Management."

Stakeholder mapping



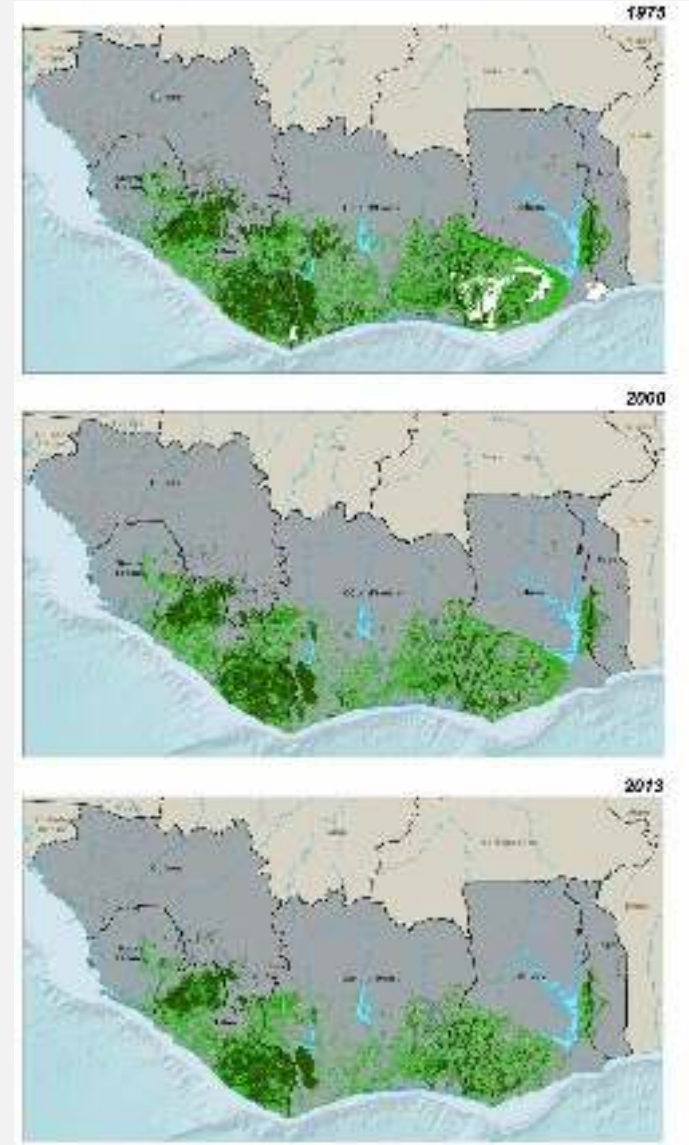
Handwritten notes on a piece of paper, including the phrase "WHAT? (to monitor) ... Forest cover / Fines (catch, burn down) ... # trees ... soil dist. ..."

General problem

Rural populations in West Africa depend heavily on land resources.

However land resource management is inadequate resulting in unsustainable use of land resources.

The region is therefore experiencing rapid forest and land degradation.



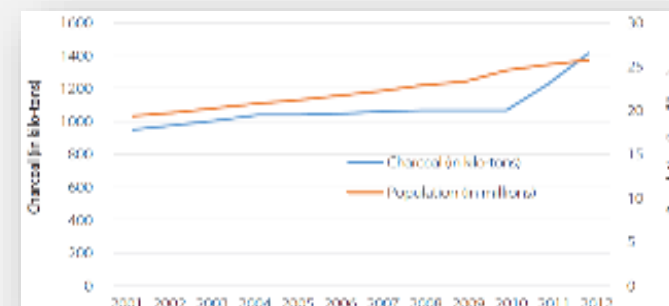
Specific problem

80 percent of the rural population depend on wood fuel as their primary source of fuel

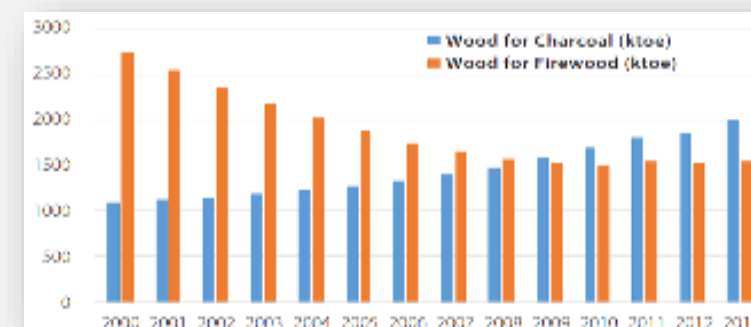
About 50 percent of the population living in urban areas use its charcoal derivative as source of fuel

Charcoal use in the short and medium term, will continue to be an important source of household energy

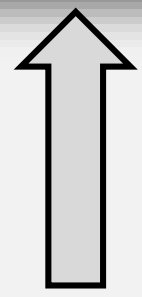
National and local authorities lack adequate information to address its negative impacts.



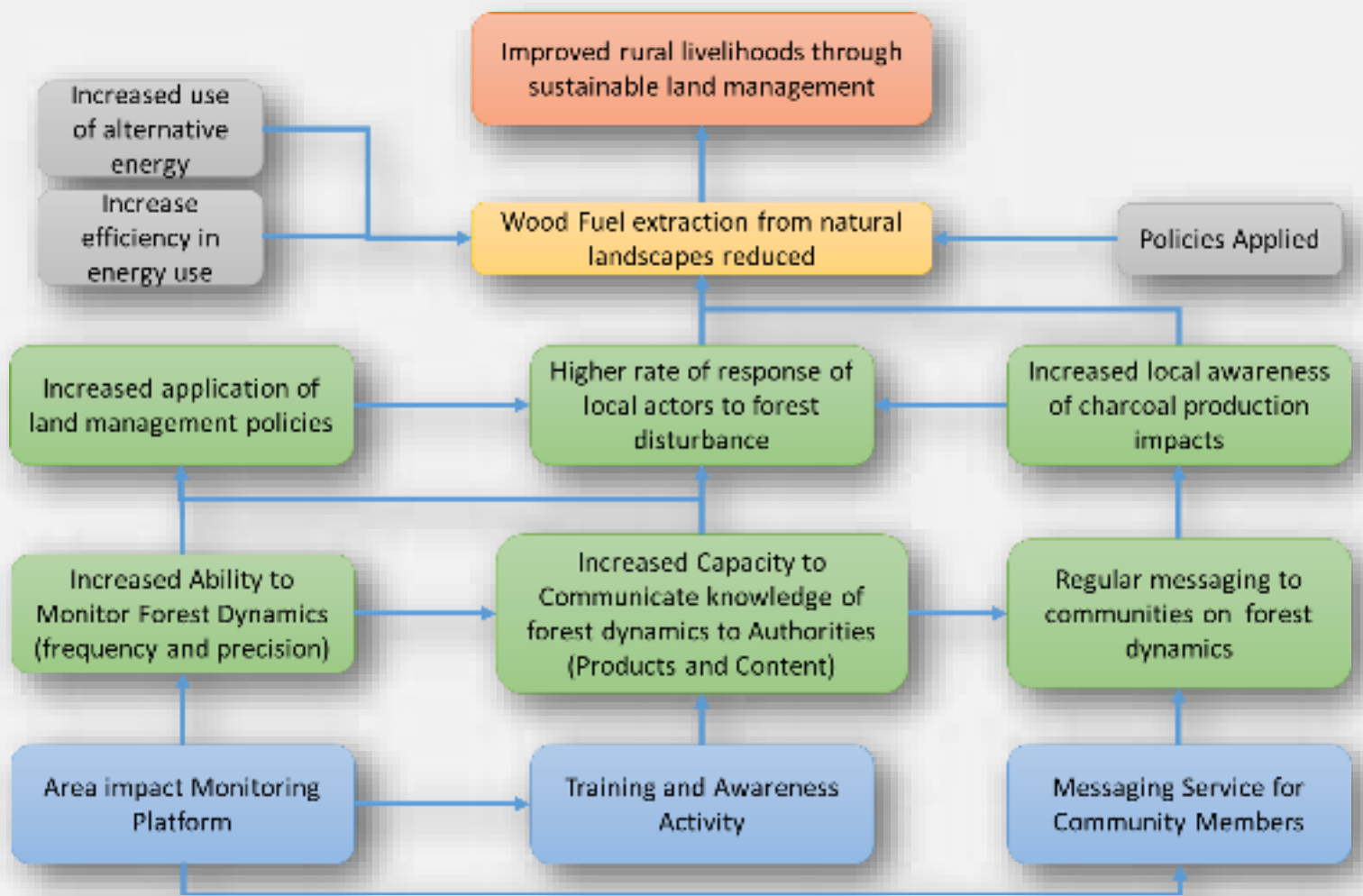
Source: Energy Commission, 2014



Charcoal production process



Theory of Change



Main objectives

Develop novel remote sensing techniques to identify and map charcoal production sites

Implement charcoal production site monitoring service to provide information at district level for environmental planning

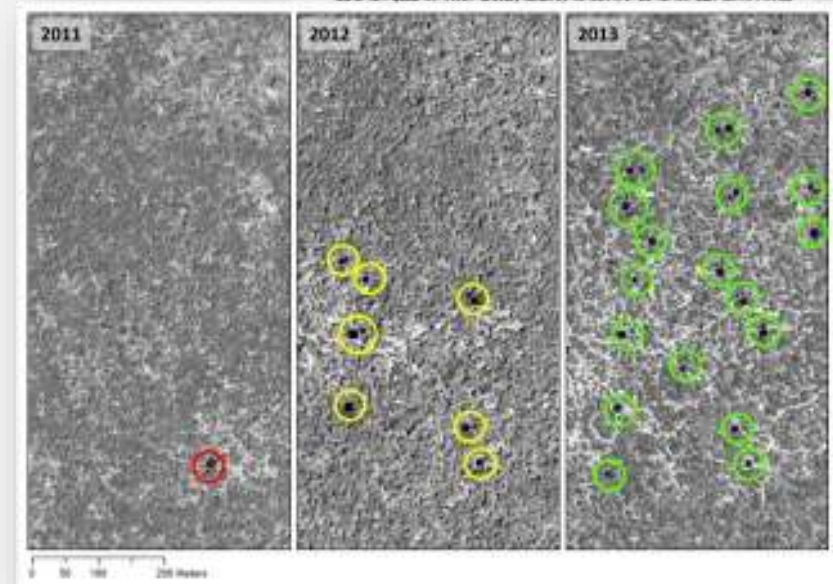
Develop messaging system to disseminate information to rural communities

Train partners to use information system for planning and decision making



Specific Tasks

- ✓ Knowledge gathering and literature review
- ✓ Field (reference) data collection
- ✓ Methodology development
- ✓ Calibration and validation of methodology
- ✓ Develop GIS-based monitoring platform
- ✓ Develop tools for disseminating messages to rural communities
- ✓ Train partners on the use of the information



Expected outputs

- Georeferenced data of charcoal production sites
- Calibrated models for site detection
- Tree cover classification maps
- Bespoke geoportal for charcoal production site monitoring
- Tools for disseminating messages to rural communities
- Trained partners on the use of the information platform
- Training manuals



Assumptions

- Charcoal production sites are detectable by space-borne remote sensing
- Partners will have access to computers and internet resources to use the information services
- Full collaboration of partners and beneficiary in developing the system
- Receptivity of partners to knowledge transfer
- Reduced income to charcoal producers
- Conflict within community as a result of controls over charcoal production

Risks mitigation

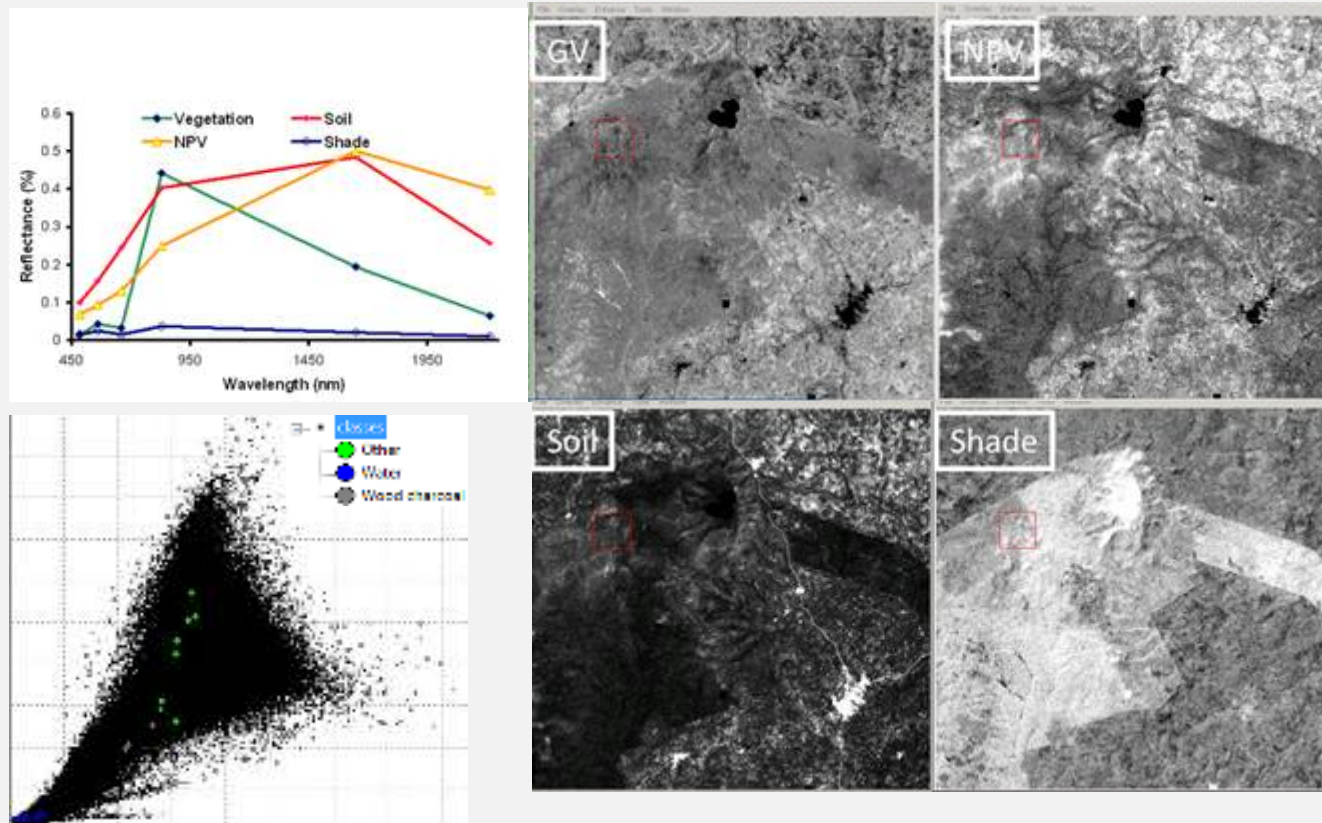
- Effective communication with project partners
- Focus on user engagement and workflow development in addition to the delivery of final data products
- Explore multiple remote sensing analysis approaches
- Promotion of alternatives to wood charcoal production by partners (e.g. briquettes), to offset reduced wood charcoal production

Specifications and Requirements

- Baseline data (reference year)
- Multi-temporal satellite image data:
 - Landsat
 - Sentinel
 - WorldView-3
- Reference data for model calibration and above ground biomass estimation
- Analytical model for charcoal site detection
- Application developer
- Mobile App developer

Remote sensing approaches - 1

Spectral mixture analysis to partition the raw spectral imagery into components viable for charcoal production site detection



Source: Wimberley, M.C., (2016)

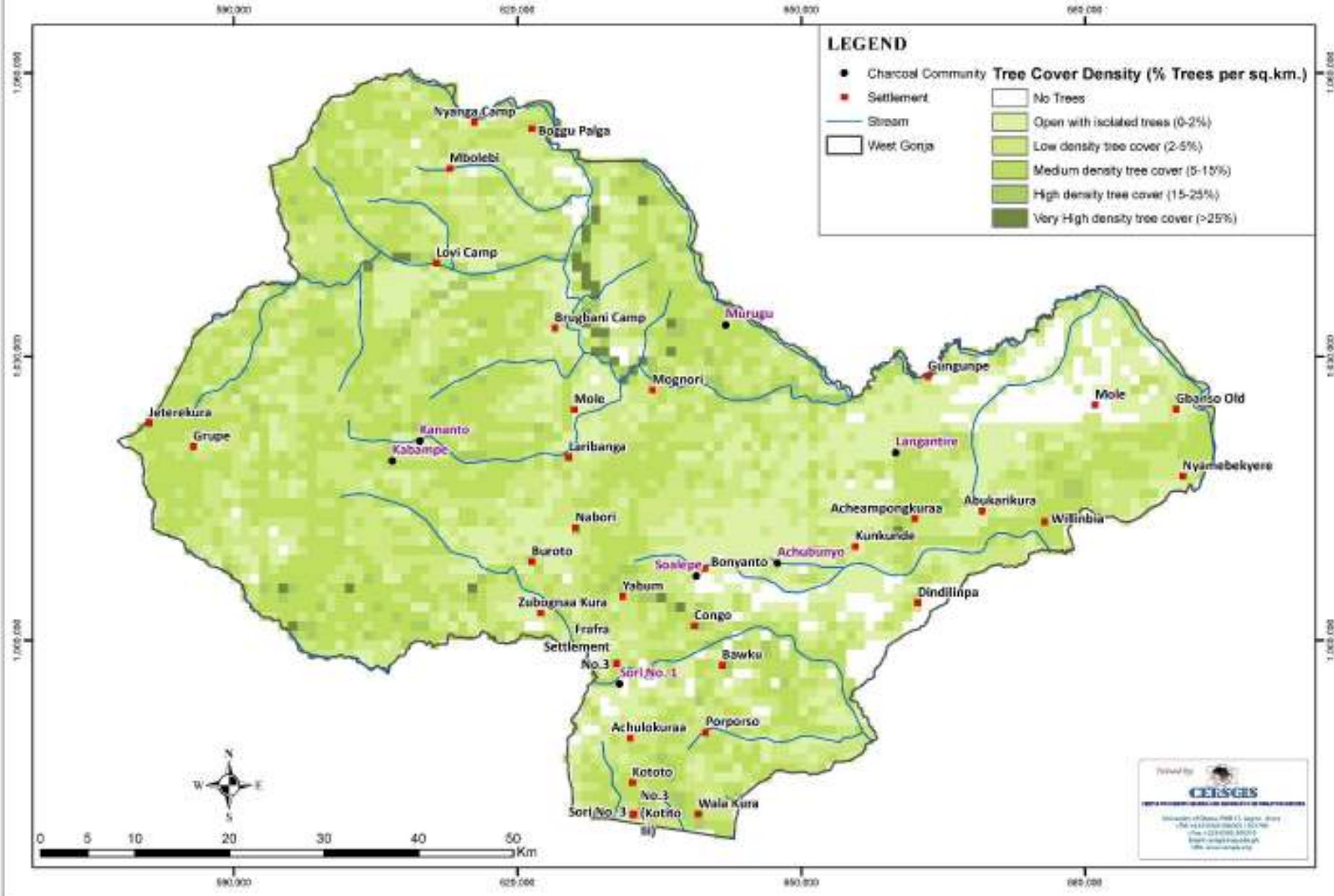
Remote sensing approaches - 2

Explore spectral index-based methods in woody savannah areas:

- Normalized Burnt Ratio
- Burned Area Index
- Char Soil Index
- Enhanced Vegetation Index



TREE DENSITY MAP OF WEST GONJA DISTRICT (2017)



Prepared by
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Collaborations

Solicit inputs for methodology development

Obtain feedback on communication mechanisms to disseminate knowledge on impact of tree cover loss to local authorities and communities

Build capacity of intermediaries (local authorities and NGOs) on the use of information and messaging platform



THANK YOU