

**Achieving the Sustainable Development Goals requires integration across science, policy and governance; monitoring and reporting; and public engagement**





**CLIMATE CHANGE**  
Targets: 1.5, 7.2, 7.3, 13.1, 15.2



**RESILIENCE TO DISASTERS AND CONFLICTS**  
Targets: 1.5, 11.5.1, 11.5.2, 16.6



**HEALTHY AND PRODUCTIVE ECOSYSTEMS**  
Targets: 1.b, 2.1, 2.4, 3.3, 6.3, 6.5, 6.6, 7.2, 11.a, 11.6, 11.a, 12.6, 12.7, 12.8, 13.3, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.c, 15.1, 15.2, 15.3, 15.4, 15.5, 15.6, 15.7, 15.8, 15.9, 15.a, 17.5, 17.14, 17.19



**ENVIRONMENTAL GOVERNANCE**  
Targets: 1.4, 10.2, 11.6, 12.4, 14.c, 15.6, 15.9, 15.a, 15.c, 16.3, 16.6, 16.7, 16.b, 17.9, 17.14, 17.16



**CHEMICALS, WASTE AND AIR QUALITY**  
Targets: 3.9, 7.a, 11.6, 12.4, 12.5



**RESOURCE EFFICIENCY**  
Targets: 2.4, 4.7, 6.4, 6.9, 9.5, 11.b, 11.c, 12.1, 12.2, 12.3, 12.6-8, 12.a, 12.b, 17.10, 17.16



**ENVIRONMENT UNDER REVIEW**  
Targets: 1.5, 2.4, 3.9, 4.7, 5.a, 6.3, 6.5, 7.2, 7.3, 8.4, 9.4, 10.7, 11.5-7, 12.3-5, 13.1, 14.1, 14.3, 14.5, 15.1-5, 15.c, 16.4, 16.10, 17.6, 17.7, 17.18, 17.19

Sound knowledge

Robust statistics and indicators

Effective governance

Integrated policies and actions

**Fully integrated and complex**

**Focus on fundamental drivers of change**

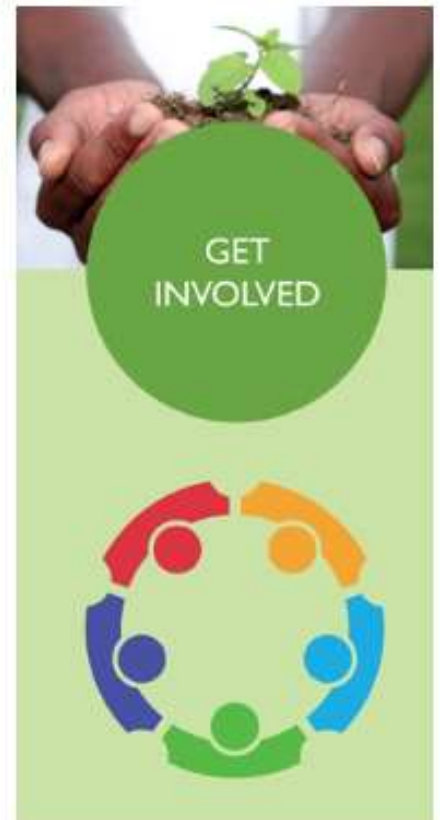
**Managing trade-offs and synergies**

## Data, indicators and information

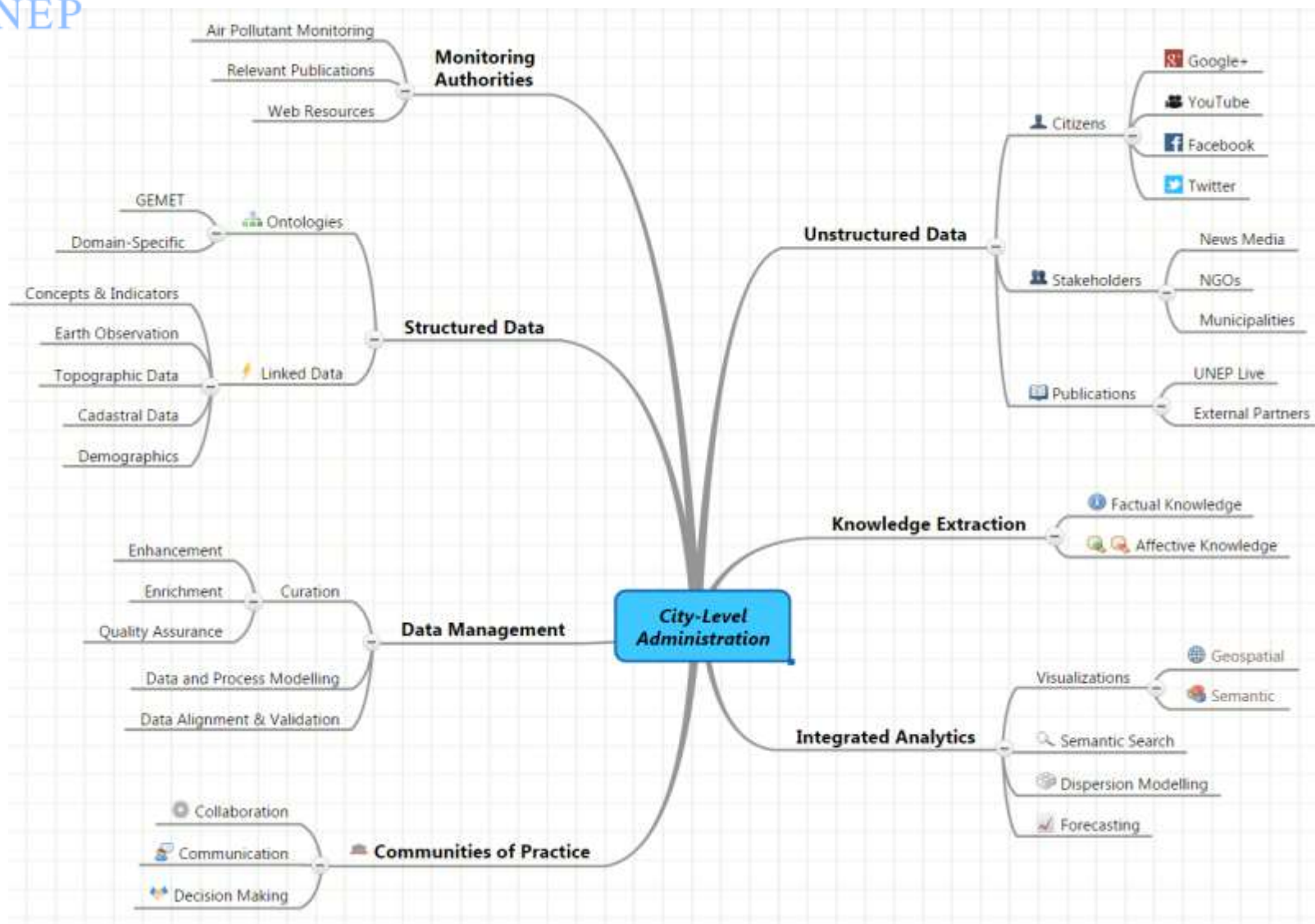
- **Indicators** – multipurpose, scalable, transparent, integrity of source and easily communicated
- **Outcome oriented** - embedding sustainable development outcomes into all activities and partnerships
- **Turning ideas into action** - providing insights and evidence on policy effectiveness
- **Reporting on progress** - ensuring high quality data, indicators and inputs are publicly available.



Search



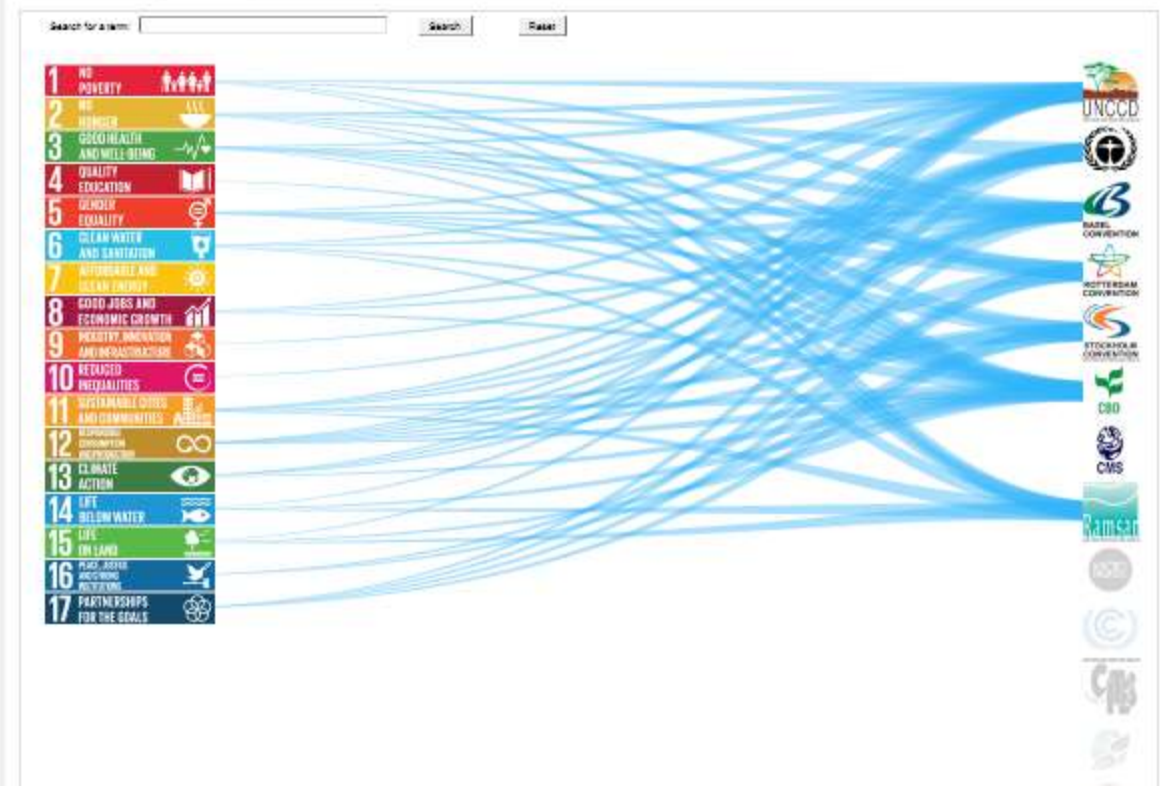
# Knowledge System Elements



Navigation bar for UNEP. Includes the UNEP logo and the text "United Nations Environment Programme environment for development". On the right, there are icons and labels for various topics: Climate Change, Shores & Coasts, Ecosystem Management, Environmental Governance, Chemicals & Waste, Resource Efficiency, and Environment Under Review.

Search and filter section. Includes a home icon, "UNEP Live" logo, "SDG Synergies" label, and dropdown menus for "Select Country/Region/Global" and "Select Theme". A "Go" button is present. Below this, there is a breadcrumb "Home > SDG Portal" and buttons for "Mapping", "Communities of Practice", "Select Language", and a search input field with a search icon.

Section header "SDG Synergies" with links "SDG Demo: Play; Download" and "Feedback". Below the header are tabs for "SDGs", "MEAs", "Synergies", "Ontologies", and "Web Intelligence".





# INNOVATION



## Air Quality



**3.7m**

**deaths due to  
outdoor air  
pollution**

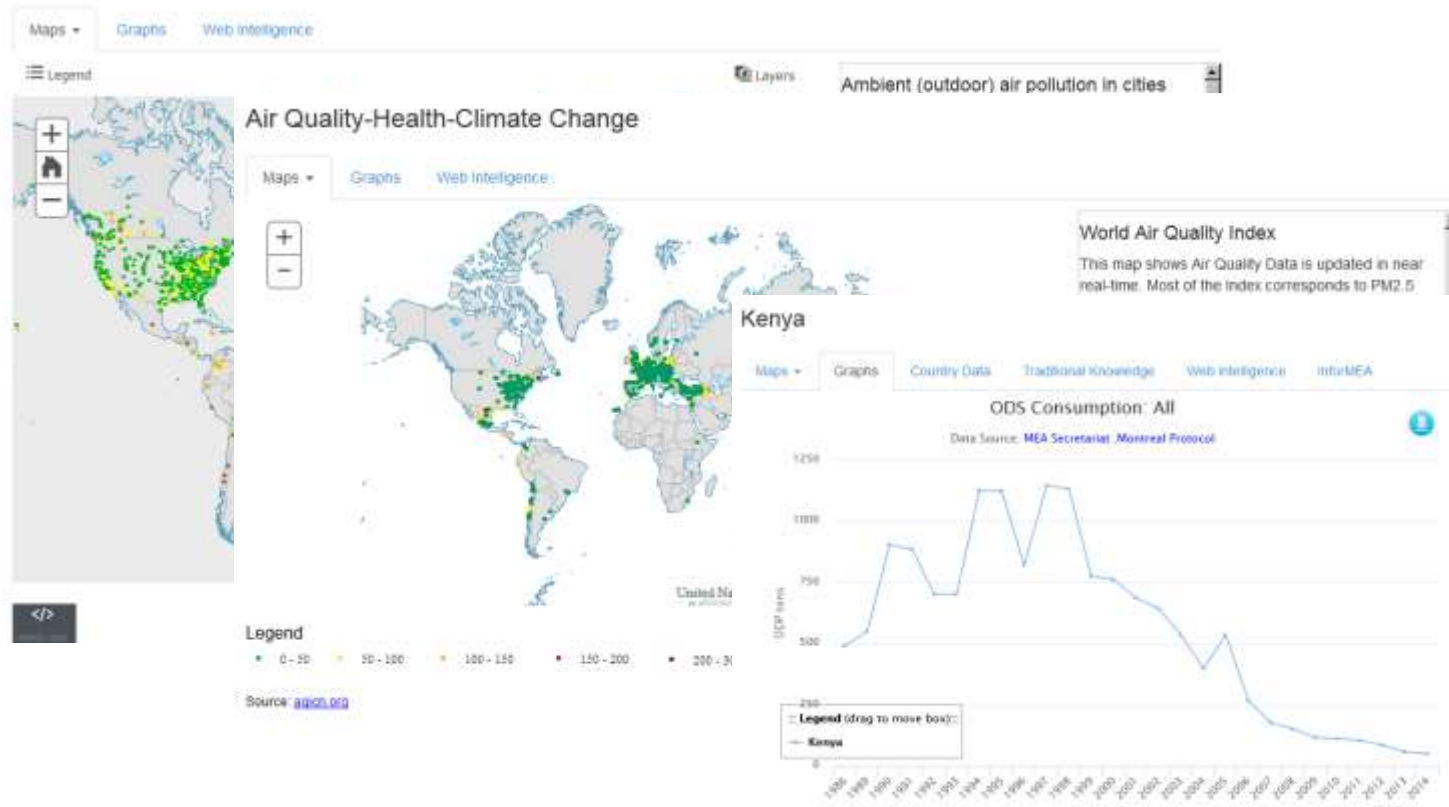


**4.3m**

**premature deaths  
due to  
indoor air pollution  
annually**



## Air Quality-Health-Climate Change



# Blueprints

← → ↺ staging1.unep.org/uneplive/media/docs/air\_quality/air\_quality.php

## AQ Project Proposal

- [AQ India project document](#)

## Blue Print

- **Circuit diagrams**
  - Gerber Power Regulation Board
    - Gerber\_drill
  - Gerber Sensor Interface Board
    - Gerber\_drill
  - [Back Sensor Interface Card image](#)
  - [Back Sensor Interface Card \(document\)](#)
  - [Front Sensor Interface Card \(image\)](#)
  - [Front Sensor Interface Card \(document\)](#)
  - [Interface board -Schematic](#)
  - [Power Regulator Board Schematic](#)
  - [System Schematic v0.6](#)
- **Components**
  - **Microcomputer and sensors**
    - **A. BeagleBone Black**
      - [BB VIEW Quick Start Guide V6](#)
      - [User Manual](#)
      - [Readme](#)
    - **B. Dust Sensor Specifications**
      - **B.1 Alphasense OPC N1**
        - [072-0296 OPC SPI interface iss 4](#)
        - [072-0300 OPC-N2 manual issue 3](#)
        - [OPC-N2](#)
        - [OPCN2\\_Firmware command list for 16\\_17](#)
      - [Revision Information v1.0](#)
    - **C. Gas Sensors Specifications**
      - **C.1 Alphasense A Series**
        - [AFE](#)
        - [COA4](#)
        - [NO2-A42F](#)
        - [NOA4](#)
        - [OX-A421](#)
        - [SO2A4](#)
      - **C.2 Alphasense B Series**





# Nairobi low cost A/Q network

- 6 sites
- Deployed late April 2016



R. Jones Univ Cambridge



## Nairobi Network Acknowledgements

**Nodes-** UNEP: funding, planning- Jacqueline McGlade

Alphasense Ltd: John Saffell, Technical Group - sensors, calibration, project management

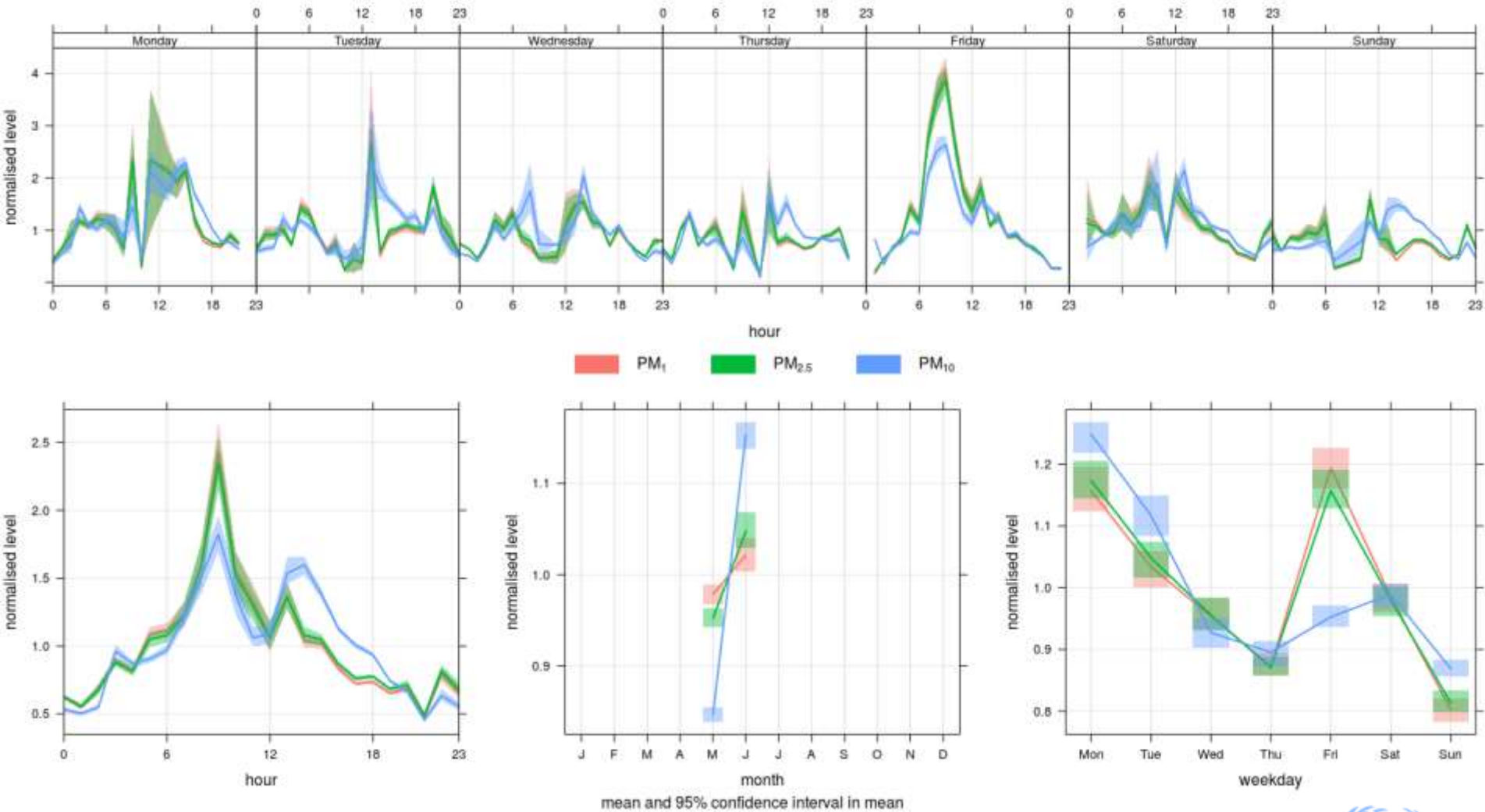
Atmospheric Sensors Ltd: electronics, comms, cloud control

**Deployment-** Analytical Monitoring systems Ltd: Robbie Lambert

UNEP: Valentin Foltescu, Priyanka DeSouza, Victor Nthusi, Sami Dimassi

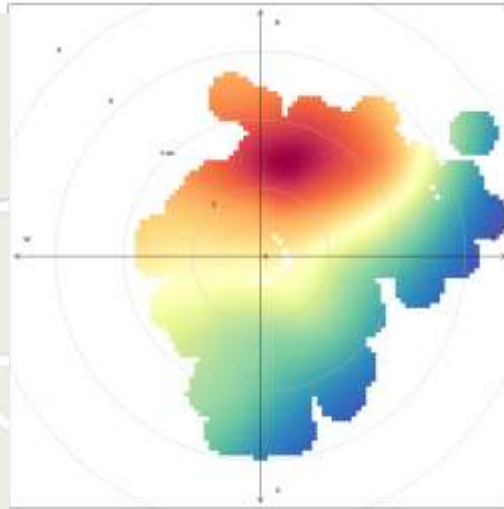
**Validation:** AEA Ricardo: Brian Stacey et al.

# Sample Site: Kibera Girls Soccer Academy

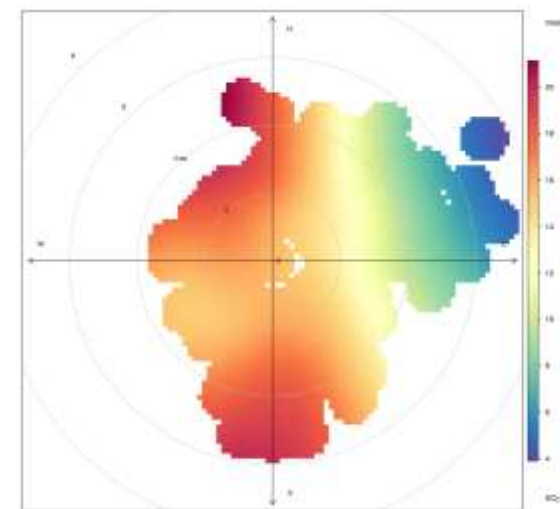




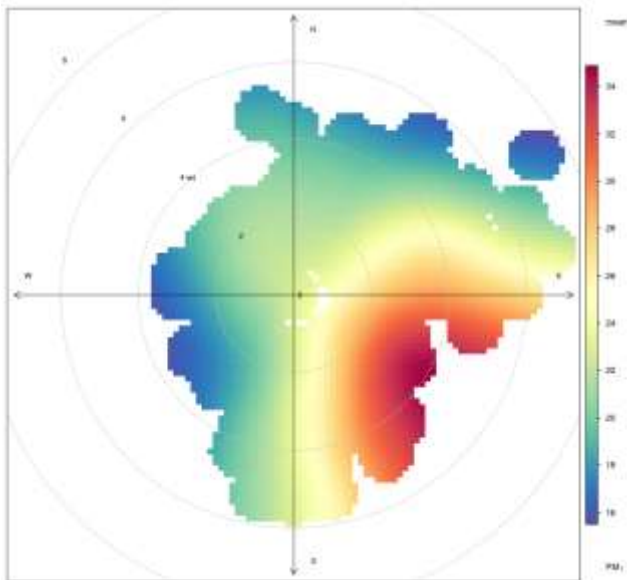
# Sample Site: Kibera Girls Soccer Academy



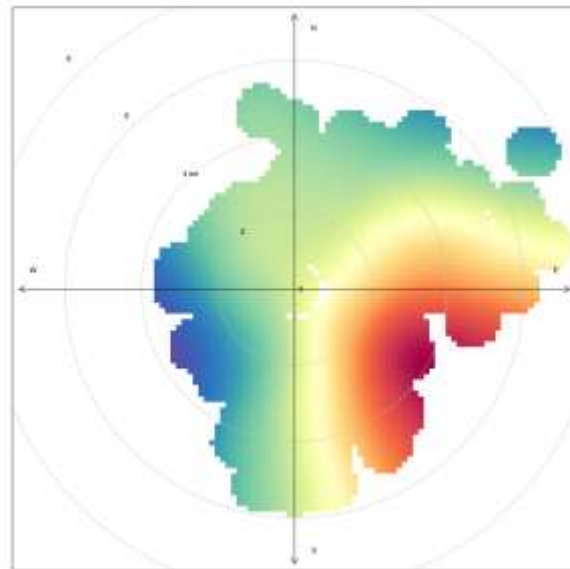
NO<sub>2</sub>



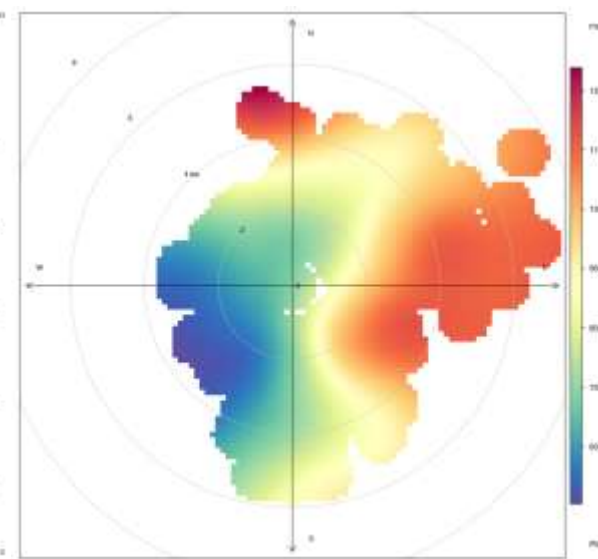
SO<sub>2</sub>



PM<sub>1</sub>

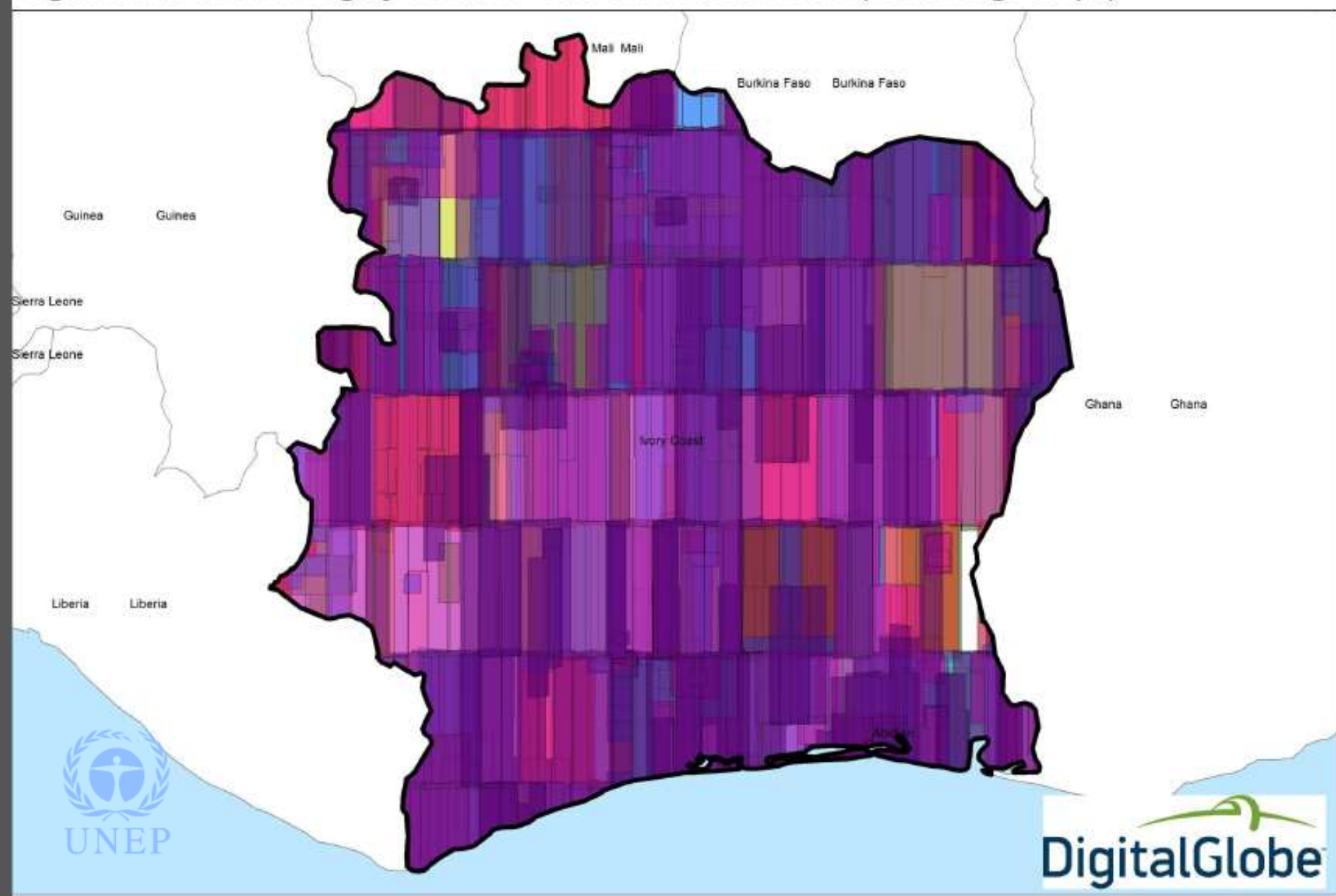


PM<sub>2.5</sub>



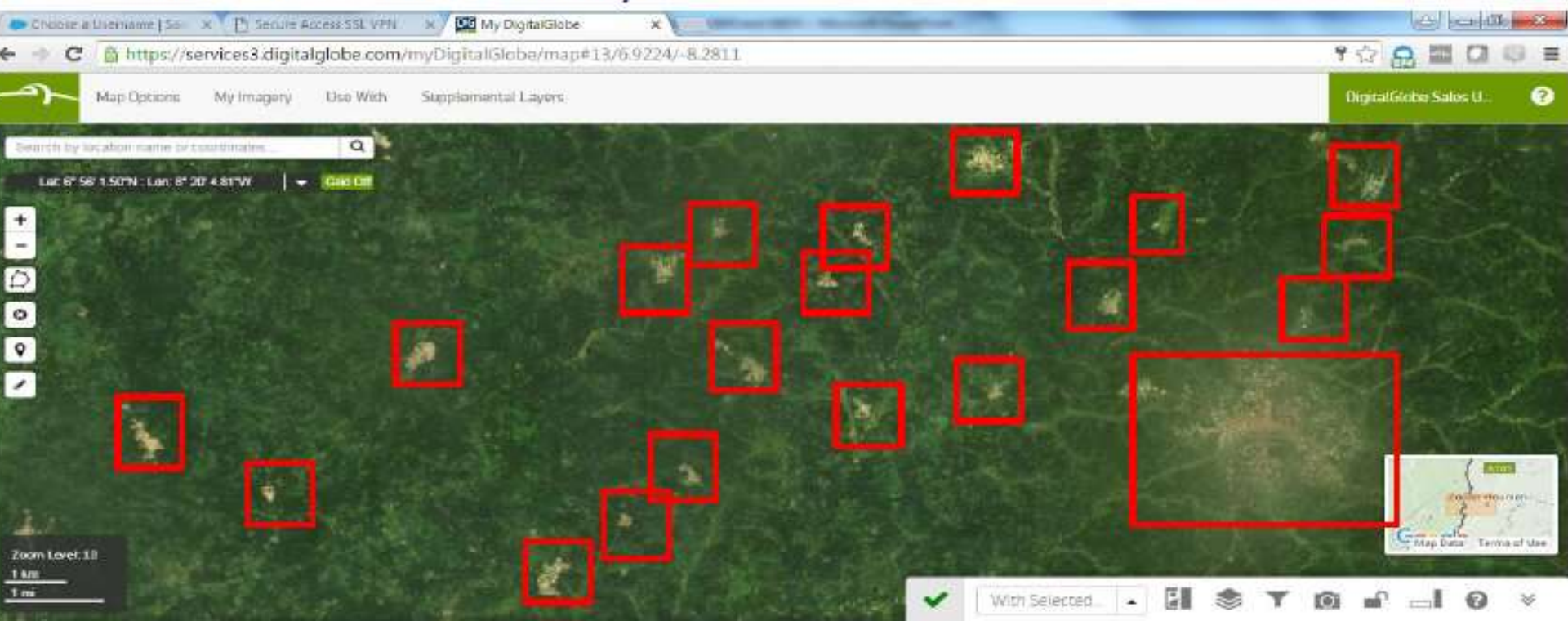
PM<sub>10</sub>

DigitalGlobe Online Imagery Content - Cote d'Ivoire 2008-2016 (2286 Image strips)



## Automated extraction of Potential sites

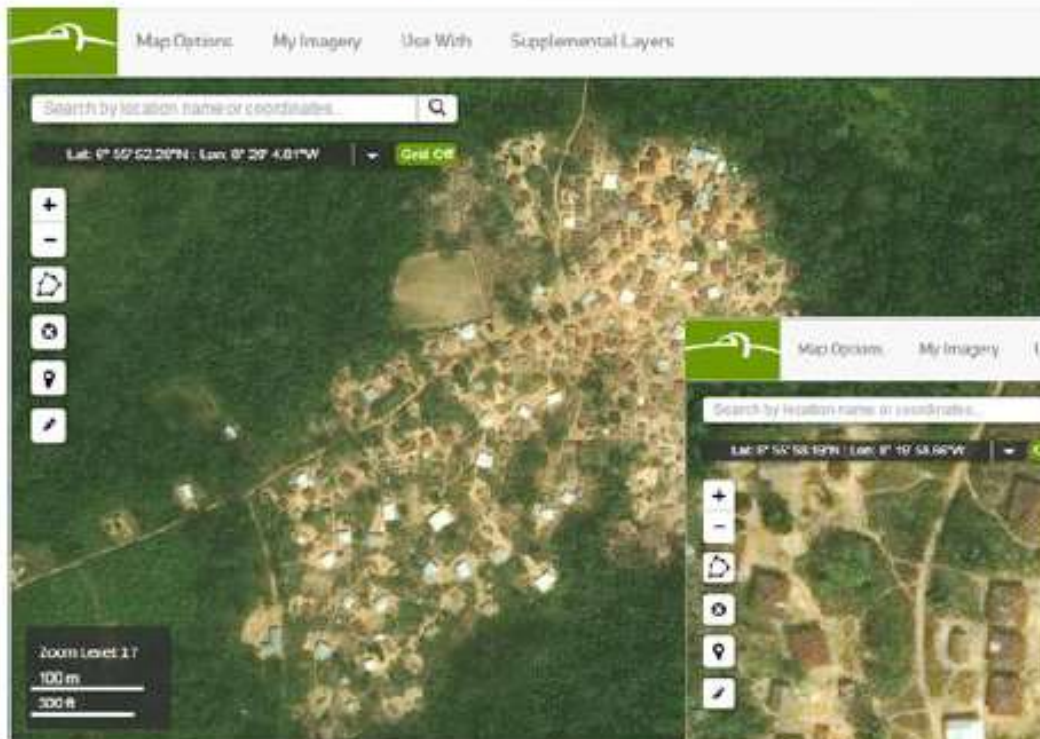
By applying change detection algorithms on the spectral bands in the imagery it is possible to automatically create areas of interest where natural vegetation has been converted to bare ground thus reducing the search area (these sites appear as scars on the earth's surface as shown below)





# Verification and artisanal Mine mapping

Each site needs to be independently verified as these “scars” could be the result of new settlements, agriculture, other factors or artisanal mining

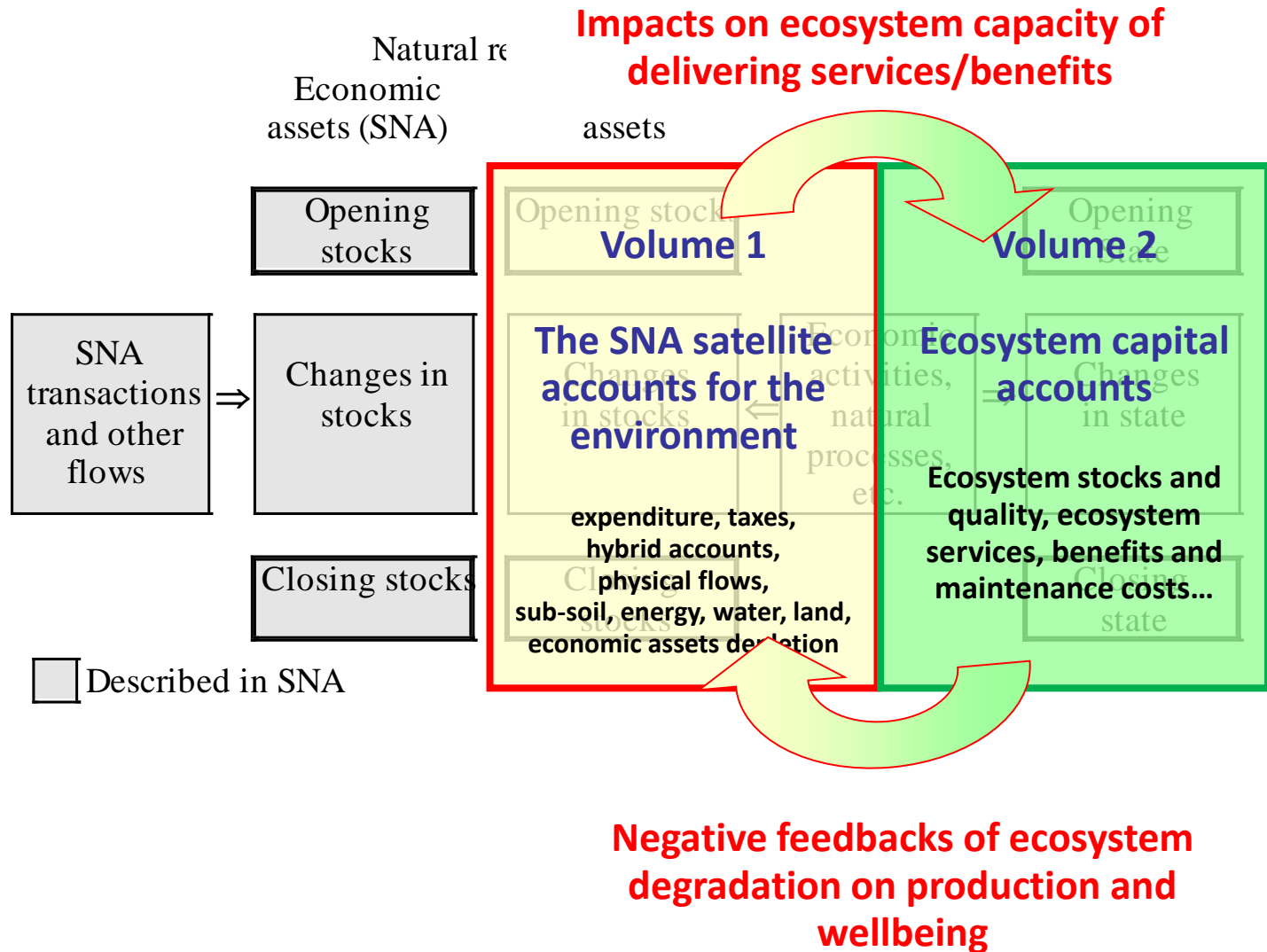
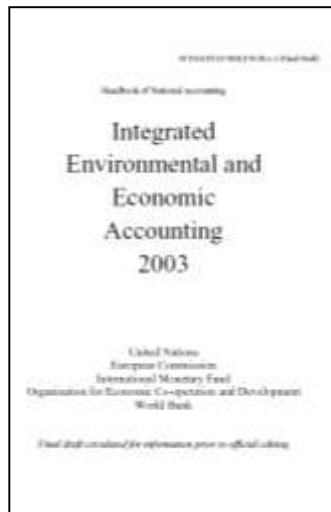


Example of scar as a result of new settlement





# UN System of Environmental Economic and Ecosystems Accounting and Sustainable Development Goal Indicators





# WIDESPREAD OBSERVED IMPACTS

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## A CHANGING WORLD

Temperature increases, sea-level rise,  
ocean acidification, changing seasons,  
new rainfall patterns



# **VULNERABLE STATES**

threatened by sea level rise  
and extreme events







**UNHEALTHY ENVIRONMENTS**

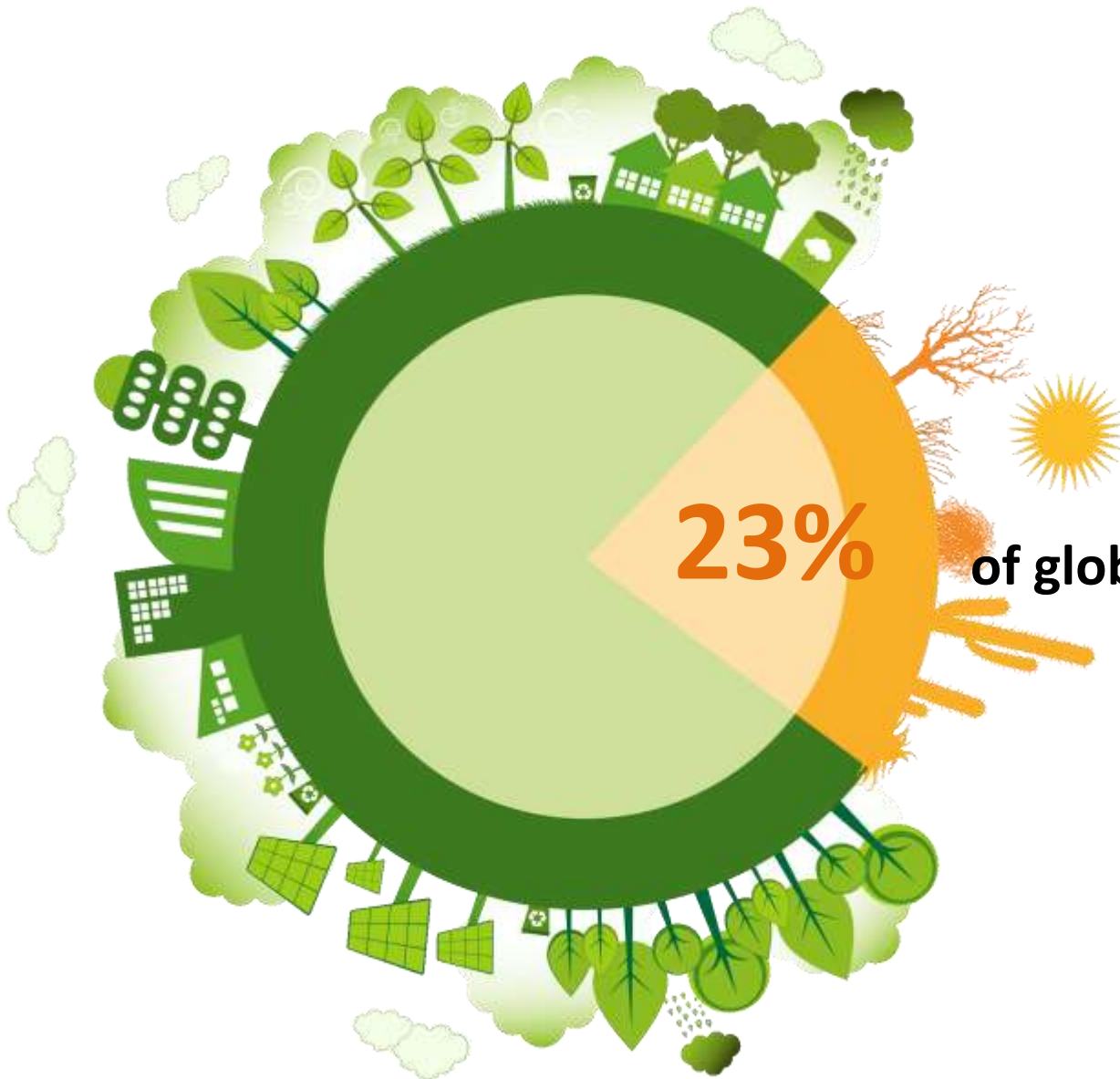


# WATER QUALITY

90% wastewater in developing countries flows untreated into rivers, lakes and the sea



# Land Use



of global soils are degraded



# UNSUSTAINABLE PRODUCT





## RESOURCE EFFICIENCY





The top half of the image features several large, orange money bags tied at the top, each with a green Euro symbol (€) on it. Interspersed among the bags are small, stylized Christmas trees. The background is a light, textured beige. The text "higher costs" is written in a dark green, sans-serif font in the upper right corner.

higher costs

The bottom half of the image shows a dark, stylized landscape with jagged, dark blue mountains. In the foreground, there are three industrial oil rigs or drilling platforms, depicted in dark blue with white structural details. Large, dark grey smokestacks are visible, emitting thick, dark grey smoke that rises into the sky. The sky is a light, textured beige, matching the top half. The text "lock-in carbon infrastructure" is written in a bold, yellow, sans-serif font at the bottom center.

lock-in carbon infrastructure









**SHARING**

**KNOWLEDGE**