icipe

African Insect Science for Food and Health

The status of using earth observation to assess crop productivity constraints in Africa – recent advances from *icipe (International Center of Insect Physiology and Ecology)*

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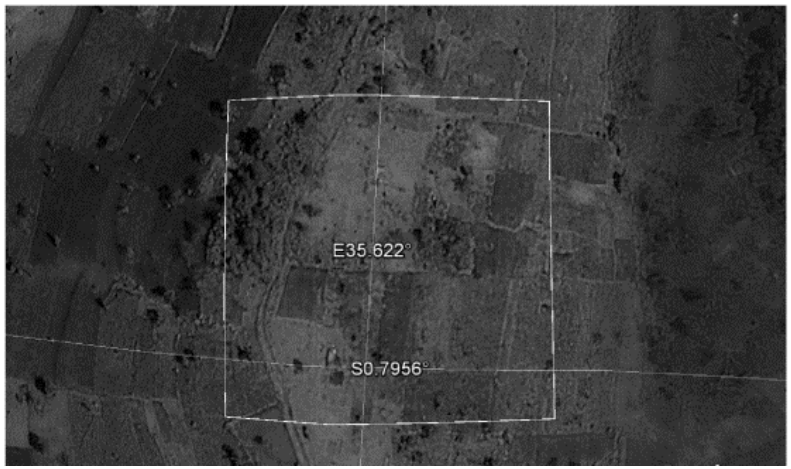
Backdrop

- EO variables & products have been used in numerous regional crop acreage and food production models
- Little progress made in small scale biotic constraints, actual yields & long-terms crop systems dynamics mapping in Africa

Backdrop

- Highly fragmented and dynamic nature of agro-ecological systems
- Recent data ‘tsunami’ offers possibilities; training a challenge

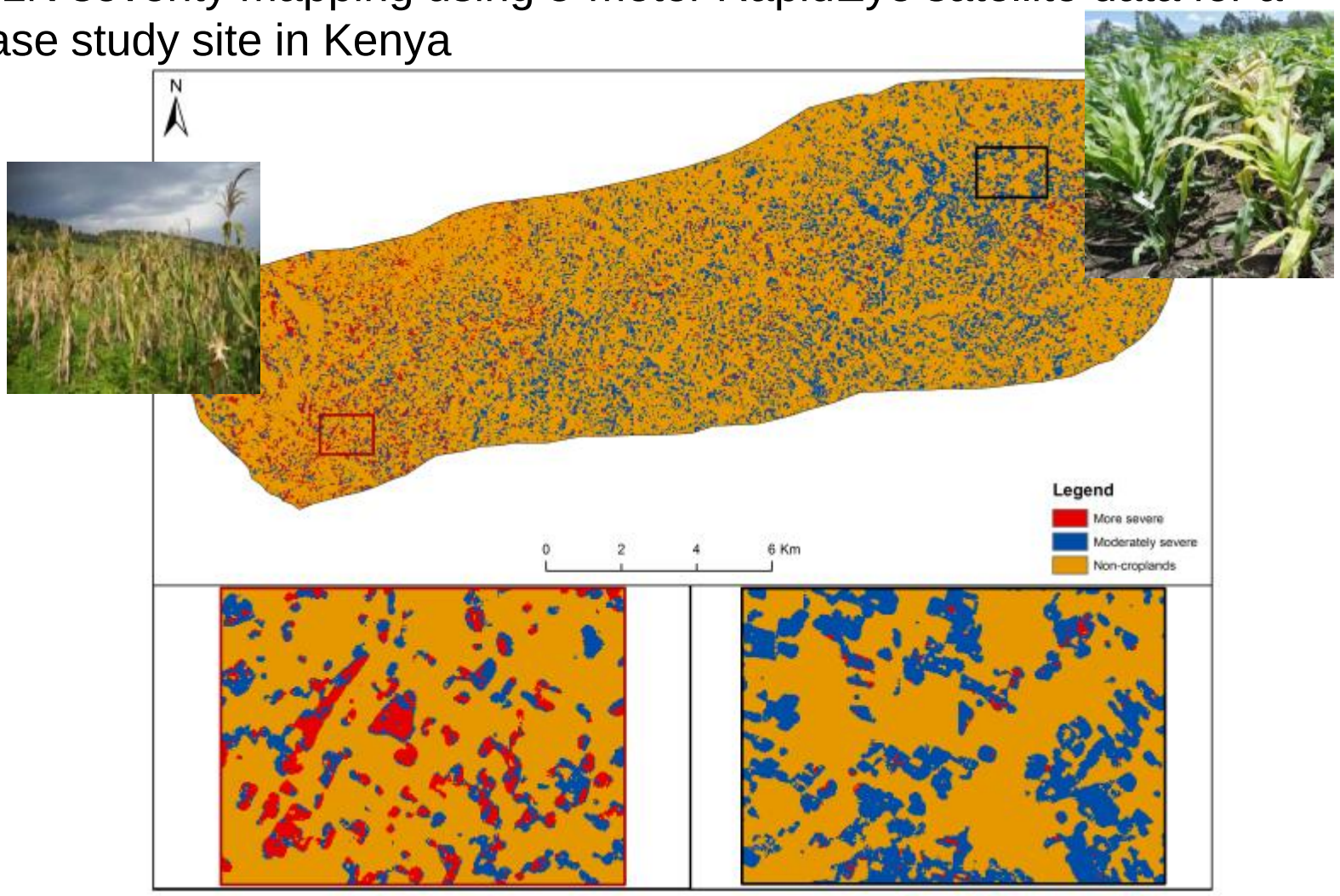


Recent advances (examples) & aims

- Examples for recent advances in biotic constraints mapping (pests and diseases in maize)
- Aims;
  - Better and more effective decision making regarding management of pests and diseases
  - Identify priority zones & where to channel “interventions”
  - Overall; **improve food security**

1. Maize Lethal Necrosis (MLN) mapping

- MLN severity mapping using 5-meter RapidEye satellite data for a case study site in Kenya

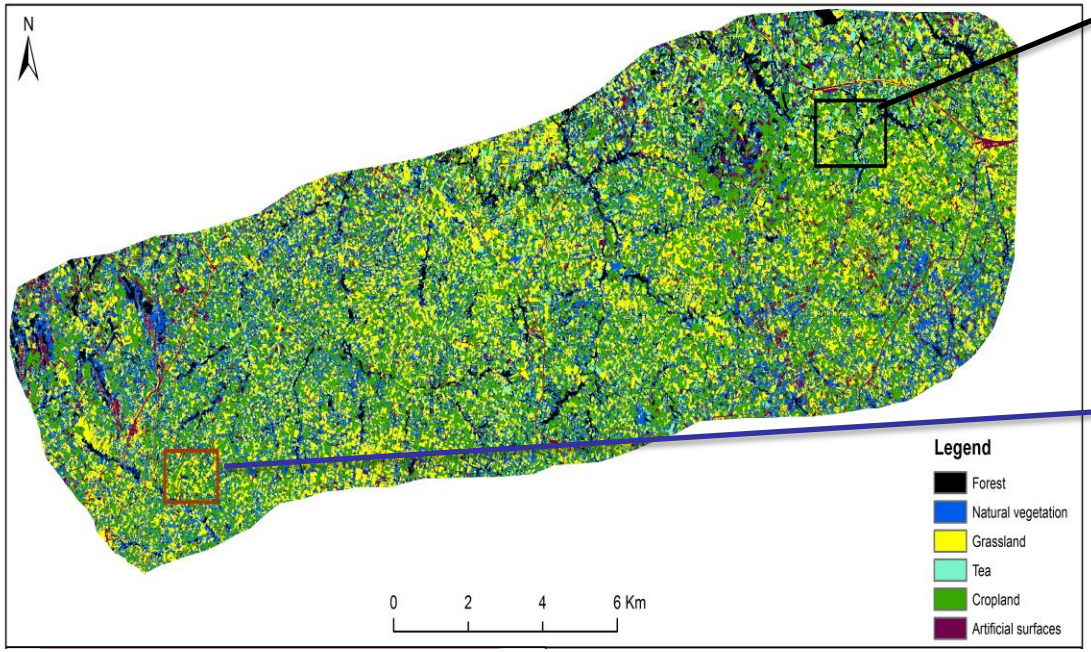


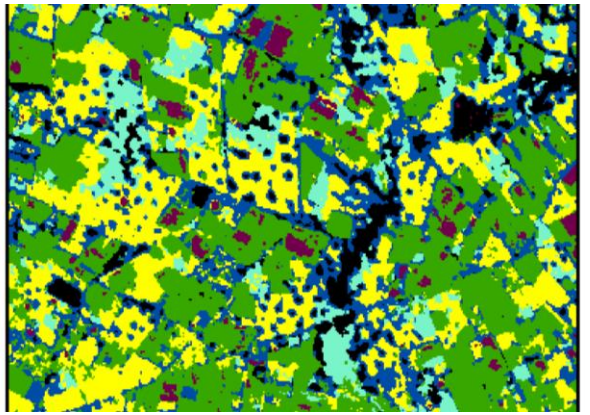
1. Maize Lethal Necrosis (MLN) mapping

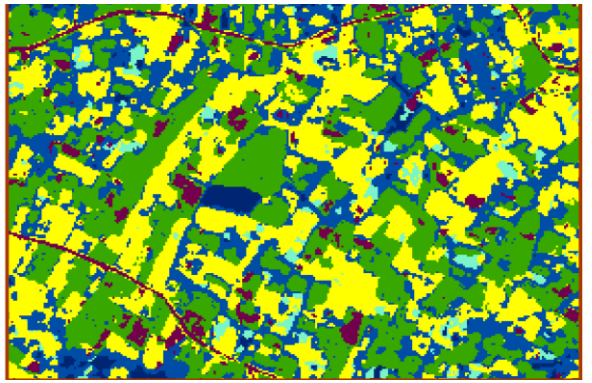
Classification Accuracy – level 1 map

Class	Cropland	Forest	Grassland	Shrubs	Soil	Tea	Total
Cropland	**295**	0	2	13	0	0	310
Forest	0	**303**	0	7	0	0	310
Grassland	2	0	**304**	4	0	0	310
Shrubs	0	0	8	**296**	0	6	310
soil	0	0	5	0	**305**	0	310
Tea	0	0	0	8	0	**302**	310
Total	297	303	321	328	305	308	1860
O.A(%)	**92.15**						

- Integrating RE and **Landsat-8** and spectral indices improved the classification accuracy for the cropped versus non-cropped area map

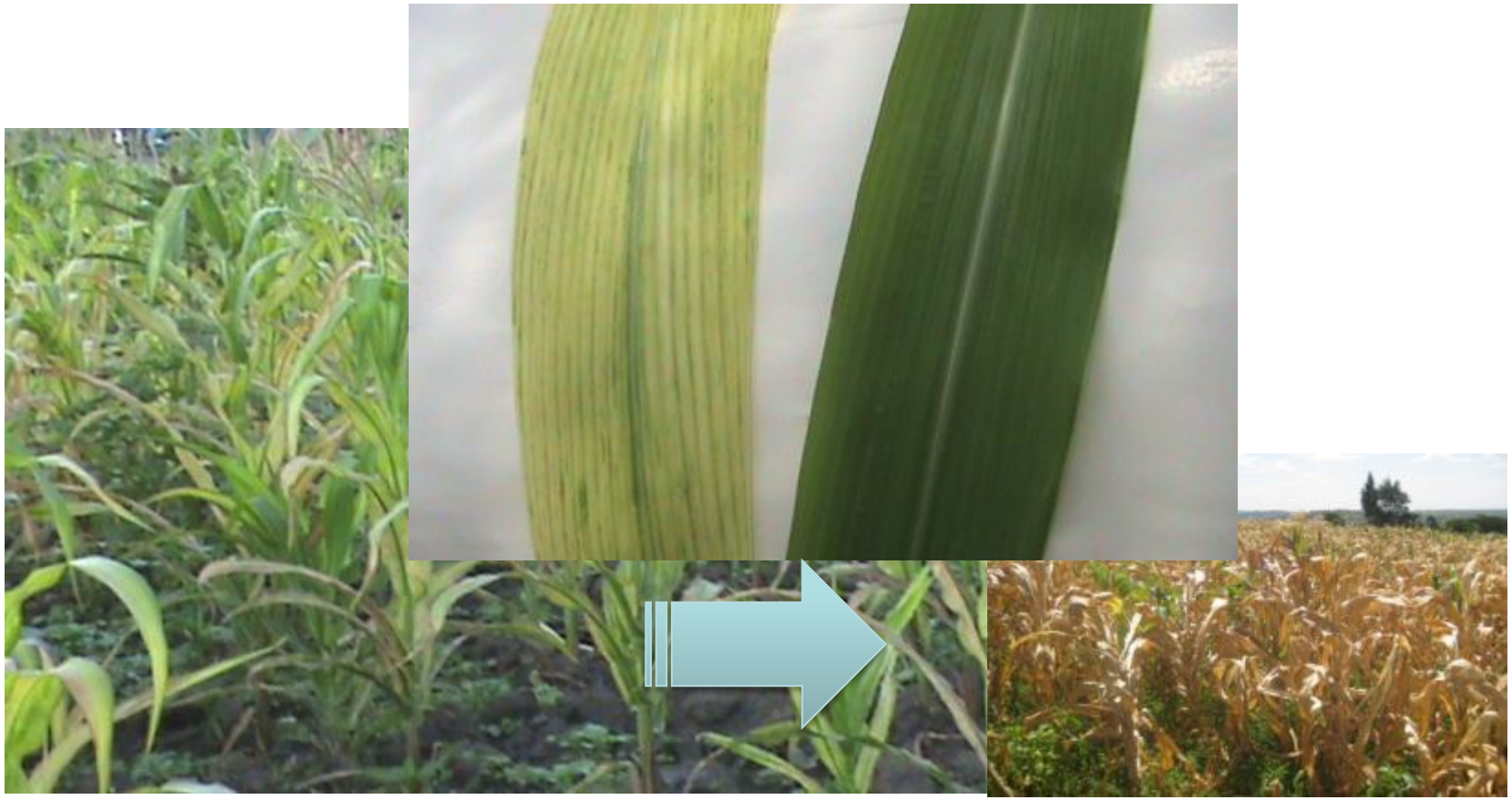






1. Maize Lethal Necrosis (MLN) mapping

Show the utility of RapidEye and Landsat-8 spectral variables to map MLN severity Bomet, Kenya



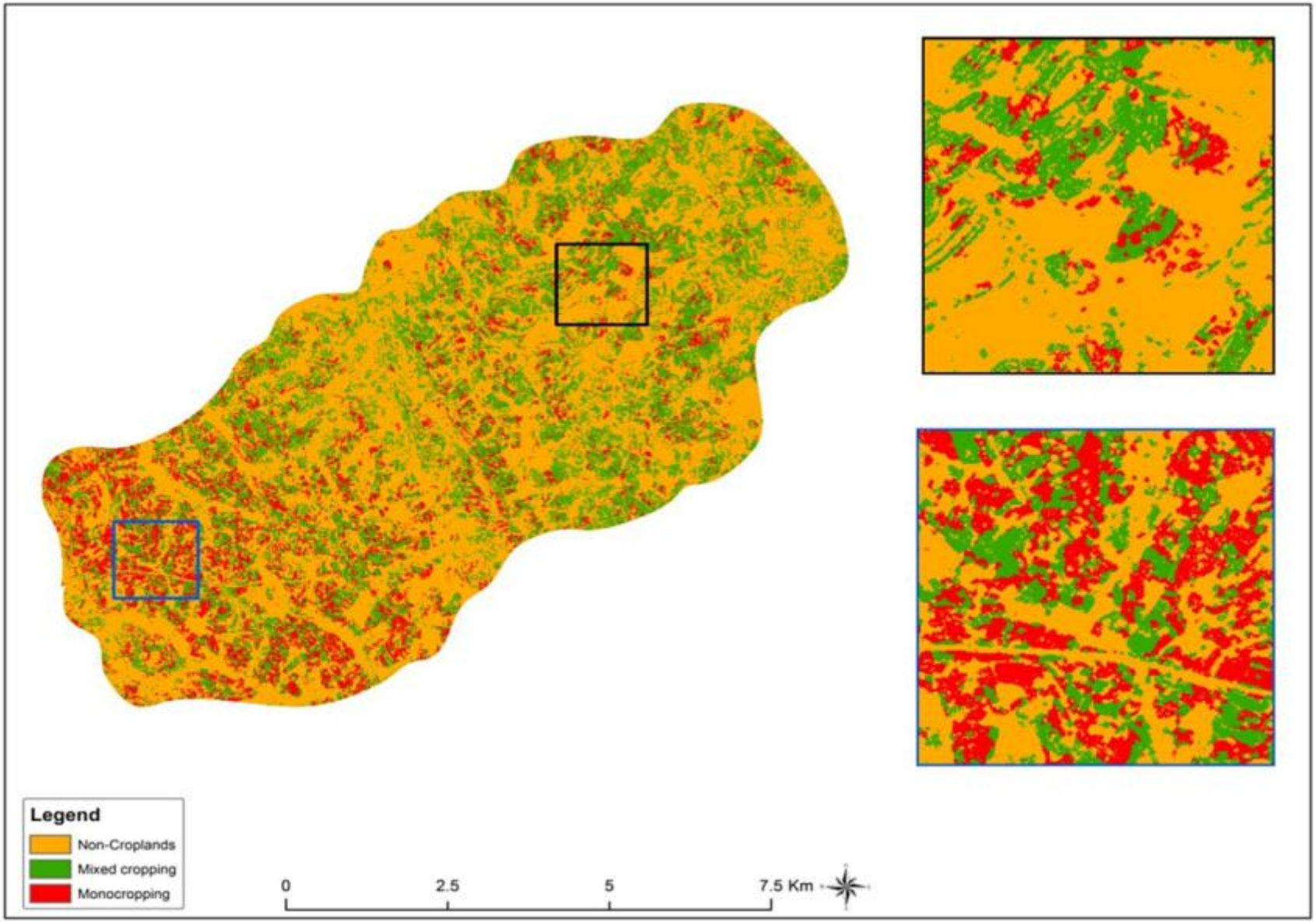
MLN Infected Maize

Ultimate Death

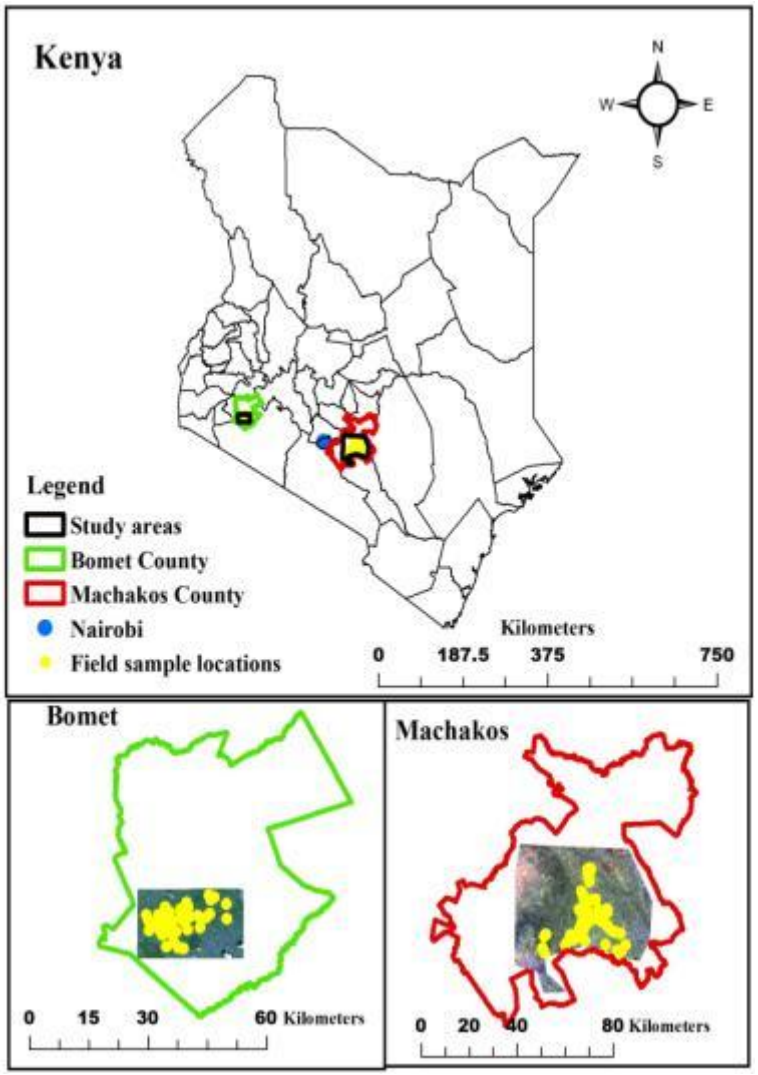
2. Example: supporting push-pull scaling

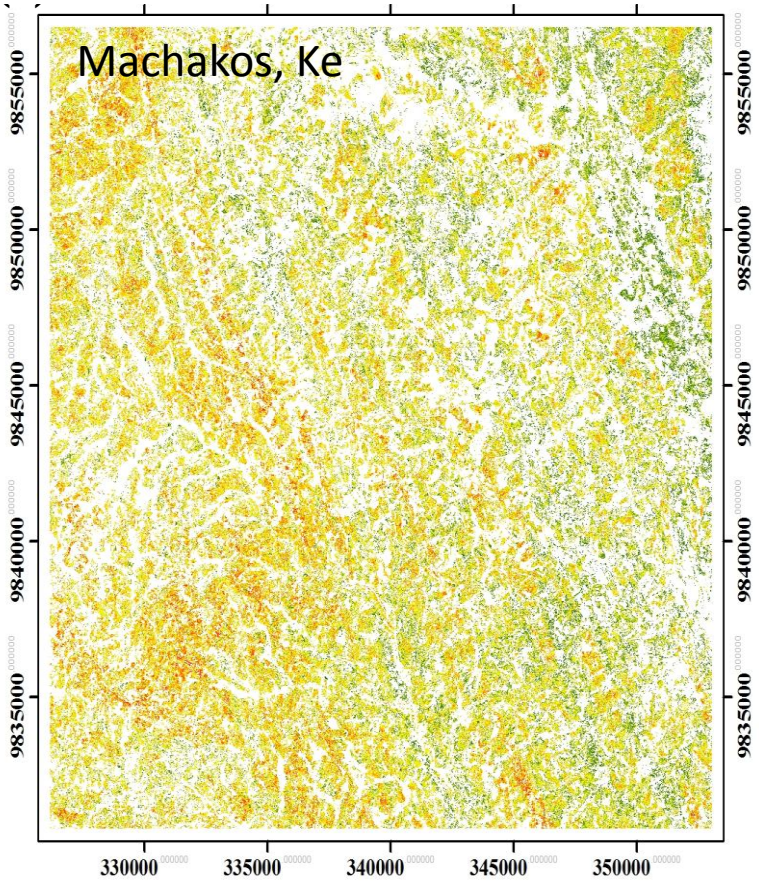
- Using explicit crop systems & stemborer density maps

2. Push-pull scaling out– crop systems



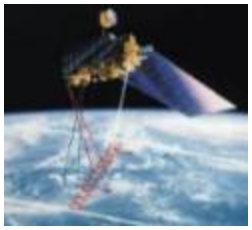
2. Push-pull scaling out – Stemborer density





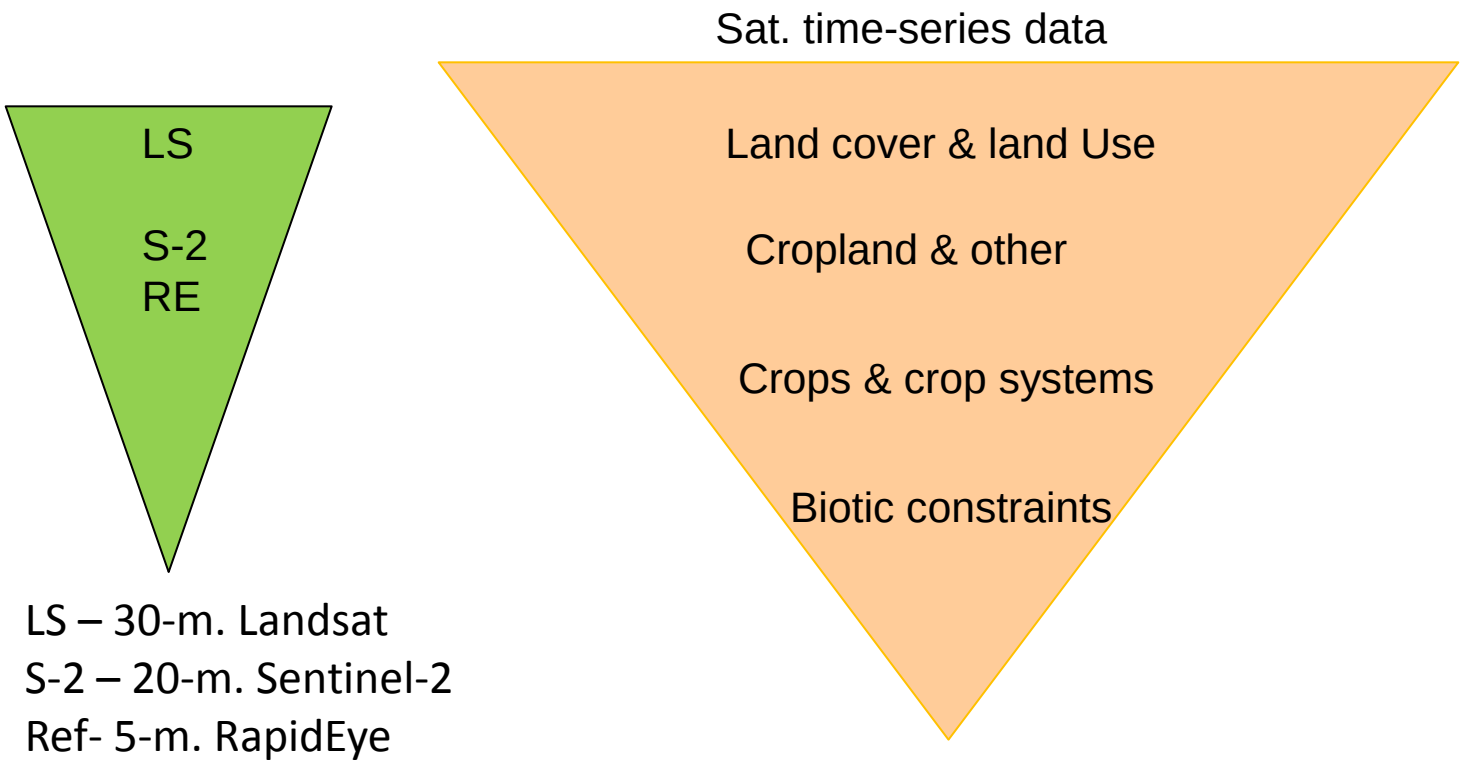
Conclusions & outlook

- Upscaling of push-pull technology to areas where the intervention is most promising/feasible
  - Within certain risk and containment (buffer) zones
- Methods not scalable; field verification data still needed
- High resolution (<10-meter resolution) data needed in Africa, but still expensive
- EO crop productivity routines are ideally linked to existing interventions on the ground (albeit small area coverage)



Conclusions & outlook

- Significant area-specific advances with newly available data sets can be expected for Africa



LS – 30-m. Landsat
S-2 – 20-m. Sentinel-2
Ref- 5-m. RapidEye

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Sida

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Thank you for your attention!

Julius-Maximilians-
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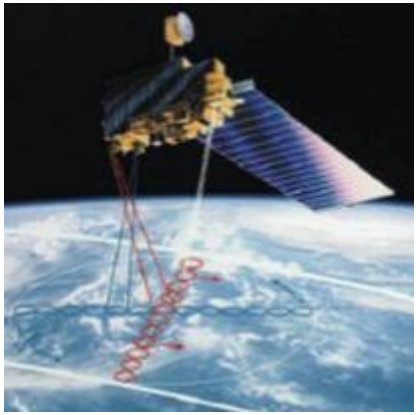
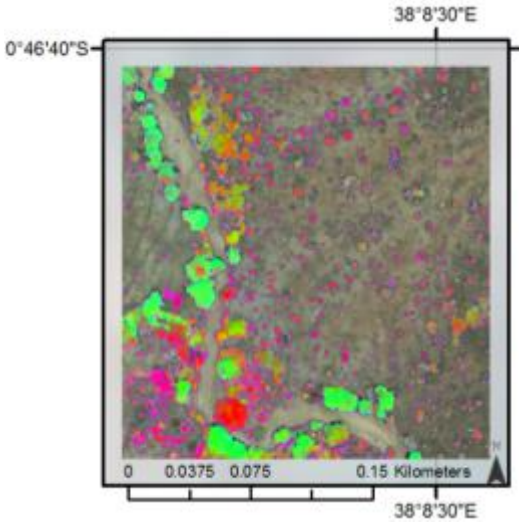
EUROPEAN COMMISSION





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