



AUTOMOTIVE



INFOCOM



MOBILITY, ENERGY &
ENVIRONMENT



AERONAUTICS



SPACE



DEFENCE & SECURITY

Earth Observation – a new perspective for the Market

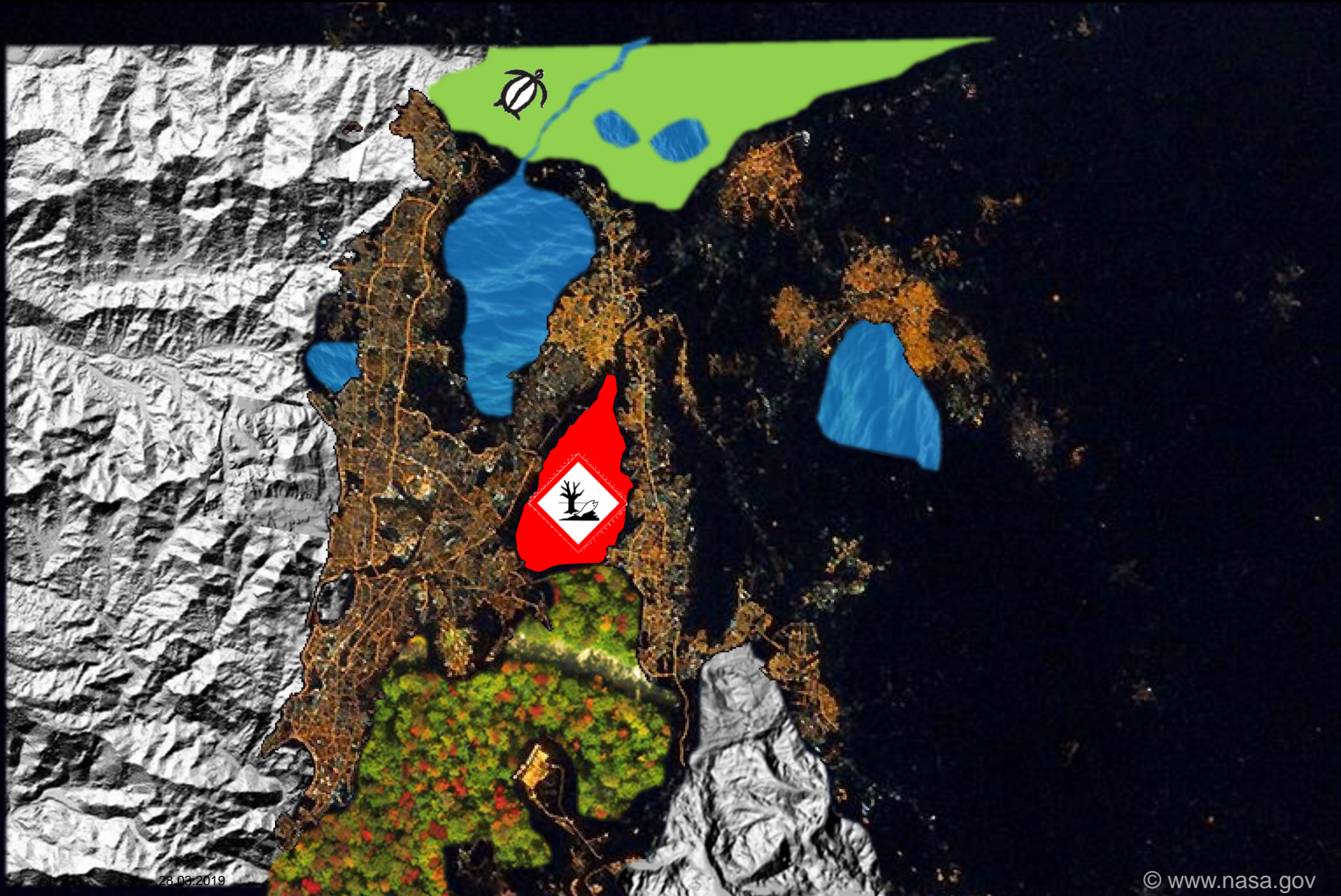
Elke Krätzschmar, Cornelius Zeller

Delhi, 2018/09/19

Content

- Earth Observation Data Sources
What can we see and what do you need?
- Remote Sensing & Image Analysis
Why is it interesting to the energy market?
- Reference Project MicroGrid India (ESA)
Use Cases and Examples of EO Services

Why do we need to look at the whole picture?



... because we don't want to set up faulty models!

MUMBAI

A satellite-style map showing the Mumbai region in India. The city of Mumbai is visible as a dense urban area on the left, surrounded by a large body of water. To the right, there is a vast, green, hilly landscape with a network of roads and rivers. The word "MUMBAI" is printed in white capital letters on the left side of the map.

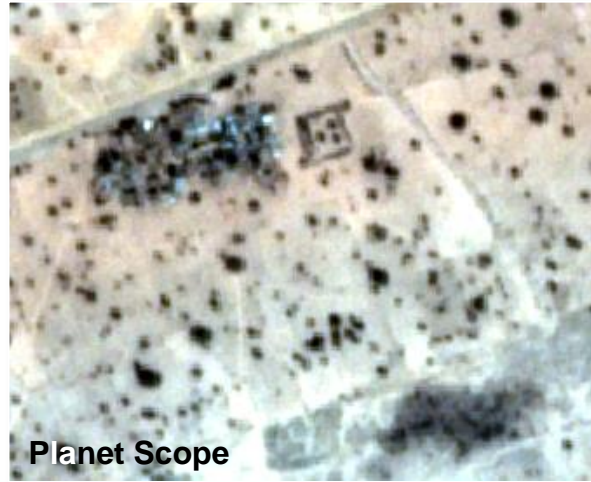
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Earth Observation Data

VHR VERY HIGH RESOLUTION SATELLITE DATA

... **HR** HIGH RESOLUTION



tasking archive or tasking

high level of detail

single date

high costs



*topographic mapping/
specific features*

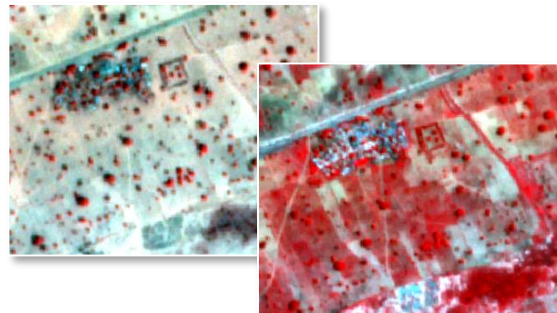
consider acquisition date!

archive (daily, 3 m)

moderate costs



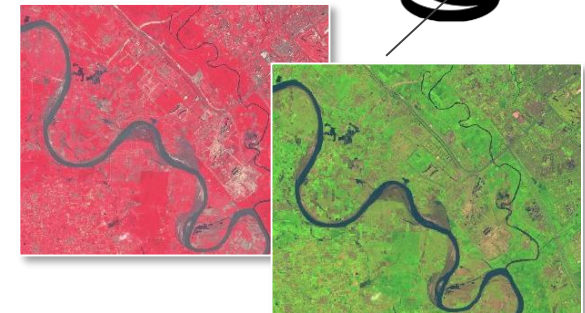
*time line analysis
date-specific search
infrastructure identification*



archive (6 days, 10 m)

large areas at once

*time line analysis
date-specific search*

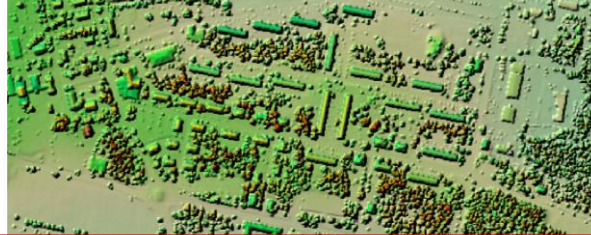


Earth Observation Data

RADAR NON-OPTICAL DATA



TERRAIN NON-OPTICAL



GLOBAL COARSE DATA LAYER



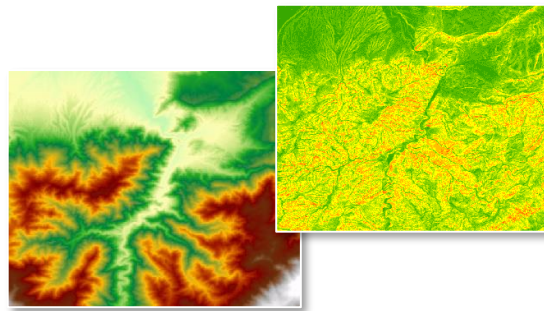
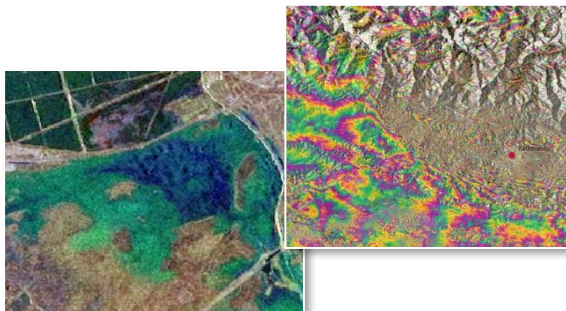
... every **sensor** type, spatial and spectral **resolution** has its **advantages and disadvantages**

... **benefit** – choose the best combination of the **right data and approach** of analysis

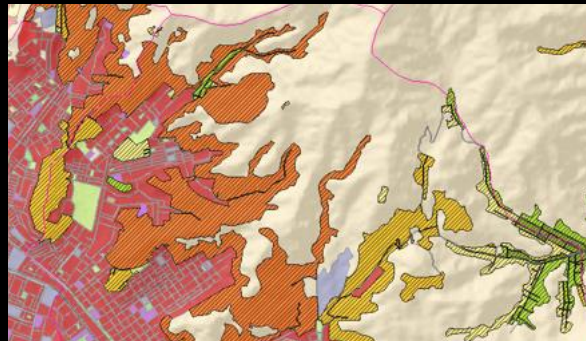
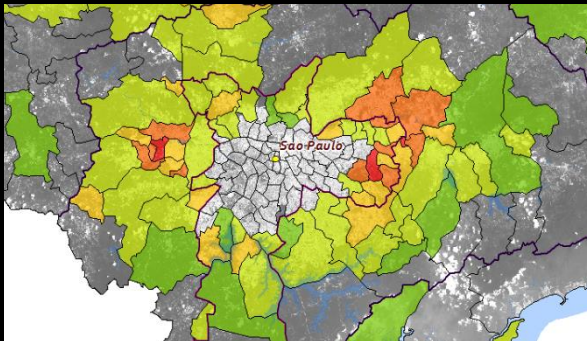
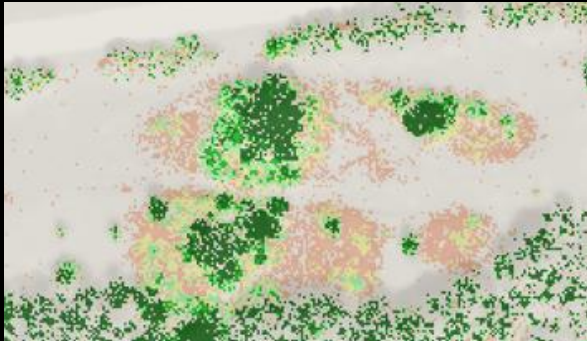
surface
terrain/ ch
timelines alm
from d

± km)
ple
ysis

serve many thematics
draft segmentation
geo-spatial analysis
(super-regional modelling)



Remote Sensing – Advanced Image Analysis



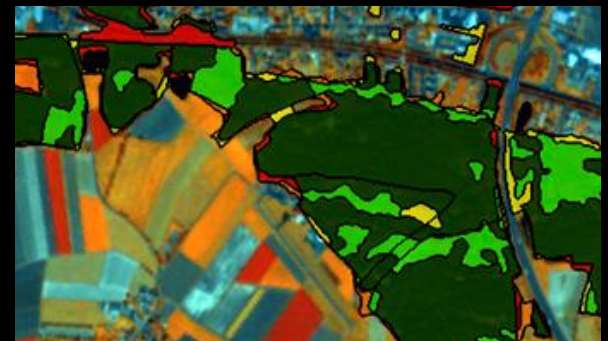
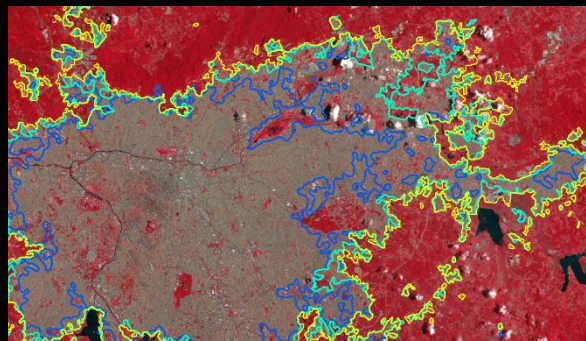
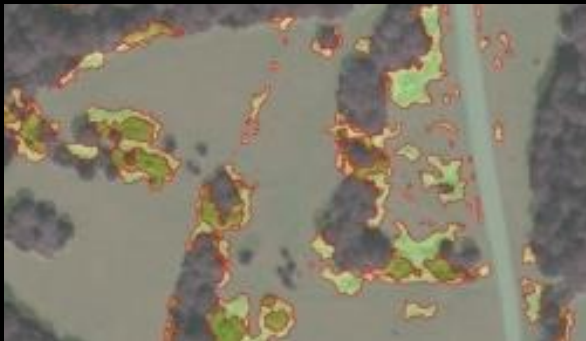
... for
urban Analysis



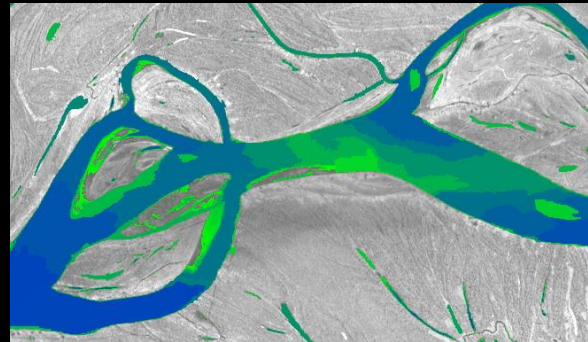
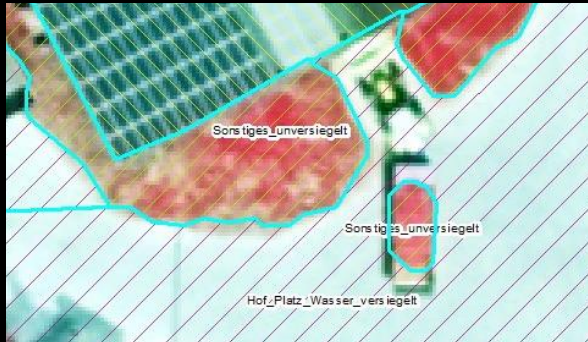
Remote Sensing – Advanced Image Analysis

Land Use

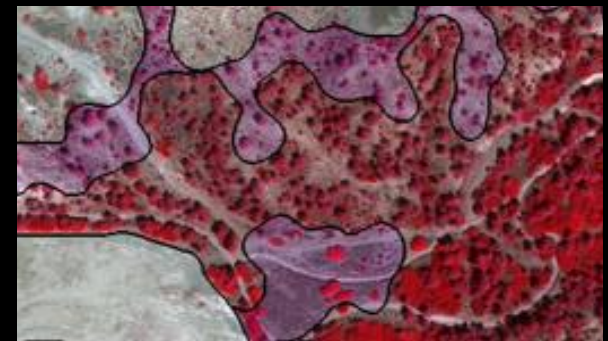
... Change



Remote Sensing – Advanced Image Analysis



... extraction of selective classes



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Reference Project

MICROGRID INDIA

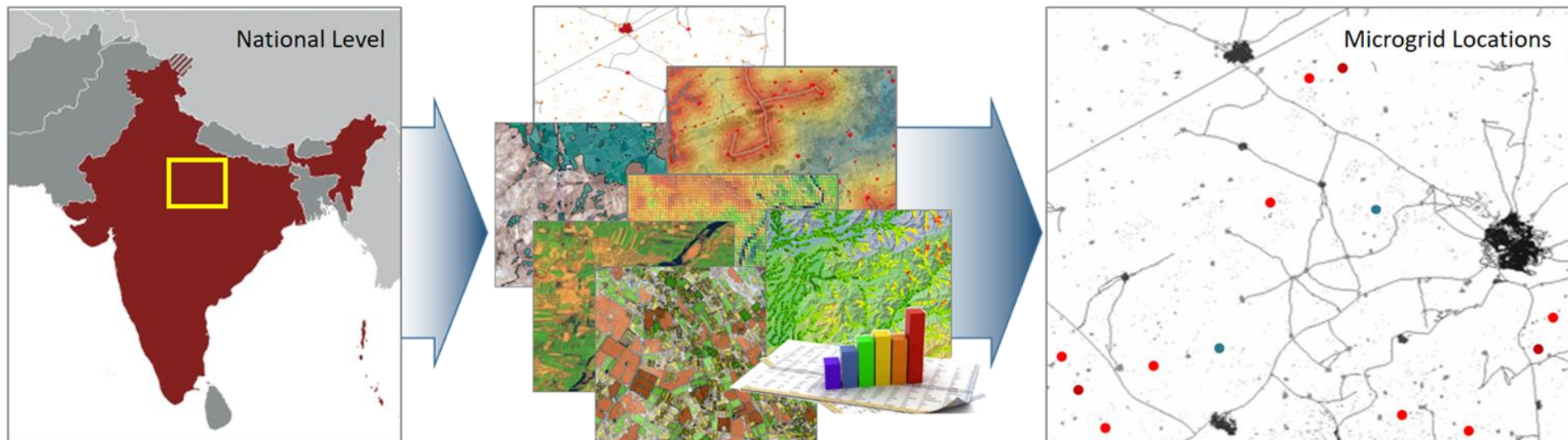
Integrated Applications for Microgrids in Developing Economies

(ESA AO/1-8891/17/UK/AD)

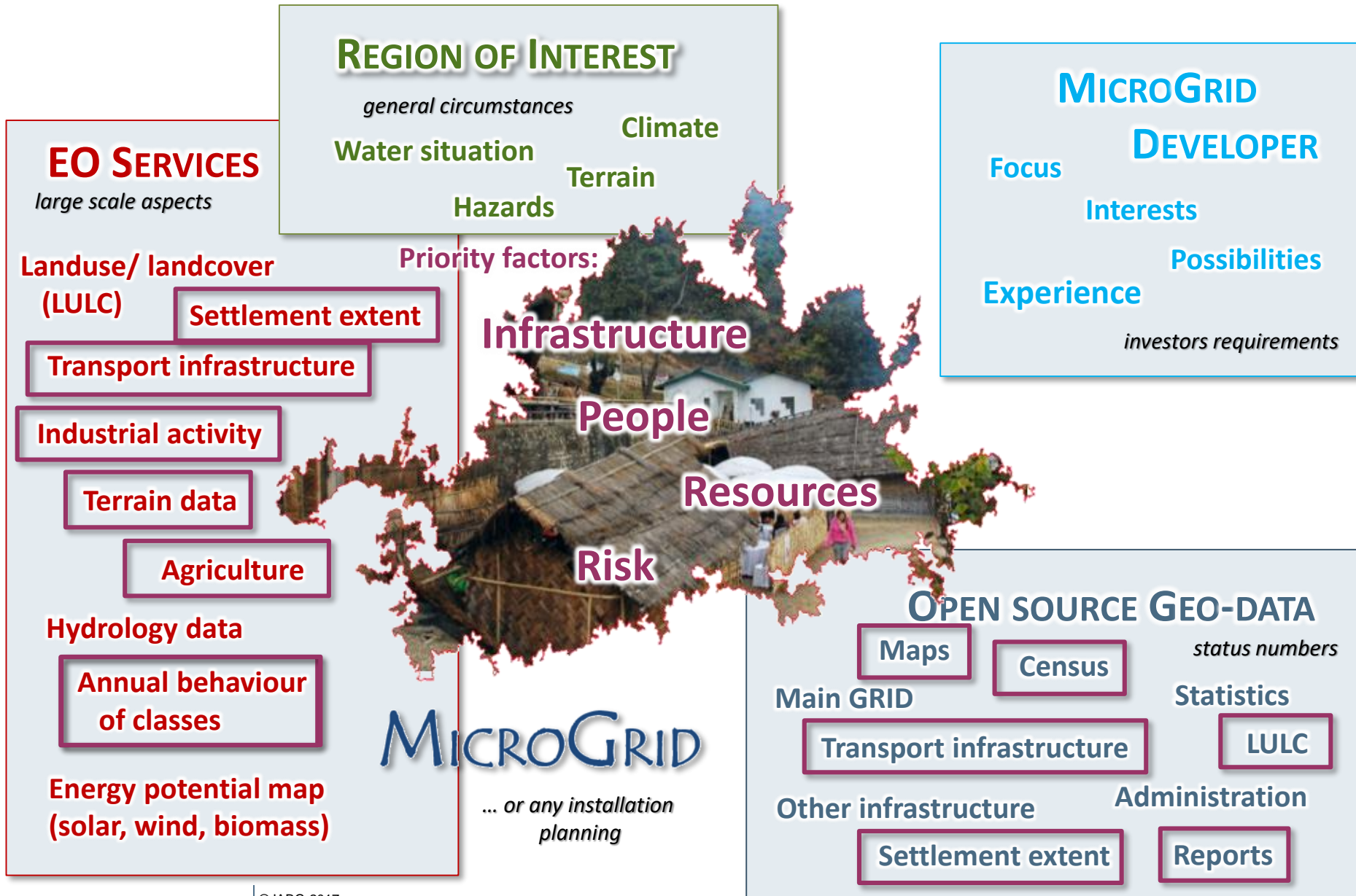
- feasibility study with focus on site identification,
- benefits of Earth Observation data and techniques
- detailed interviews with microgrid developer



Expo Booth
14.17A



Finding the right place to act



Finding the right place to act



TFE Consulting

Infrastructure

People

Resources

Risk

Finding the right place to act



TFE Consulting

Infrastructure



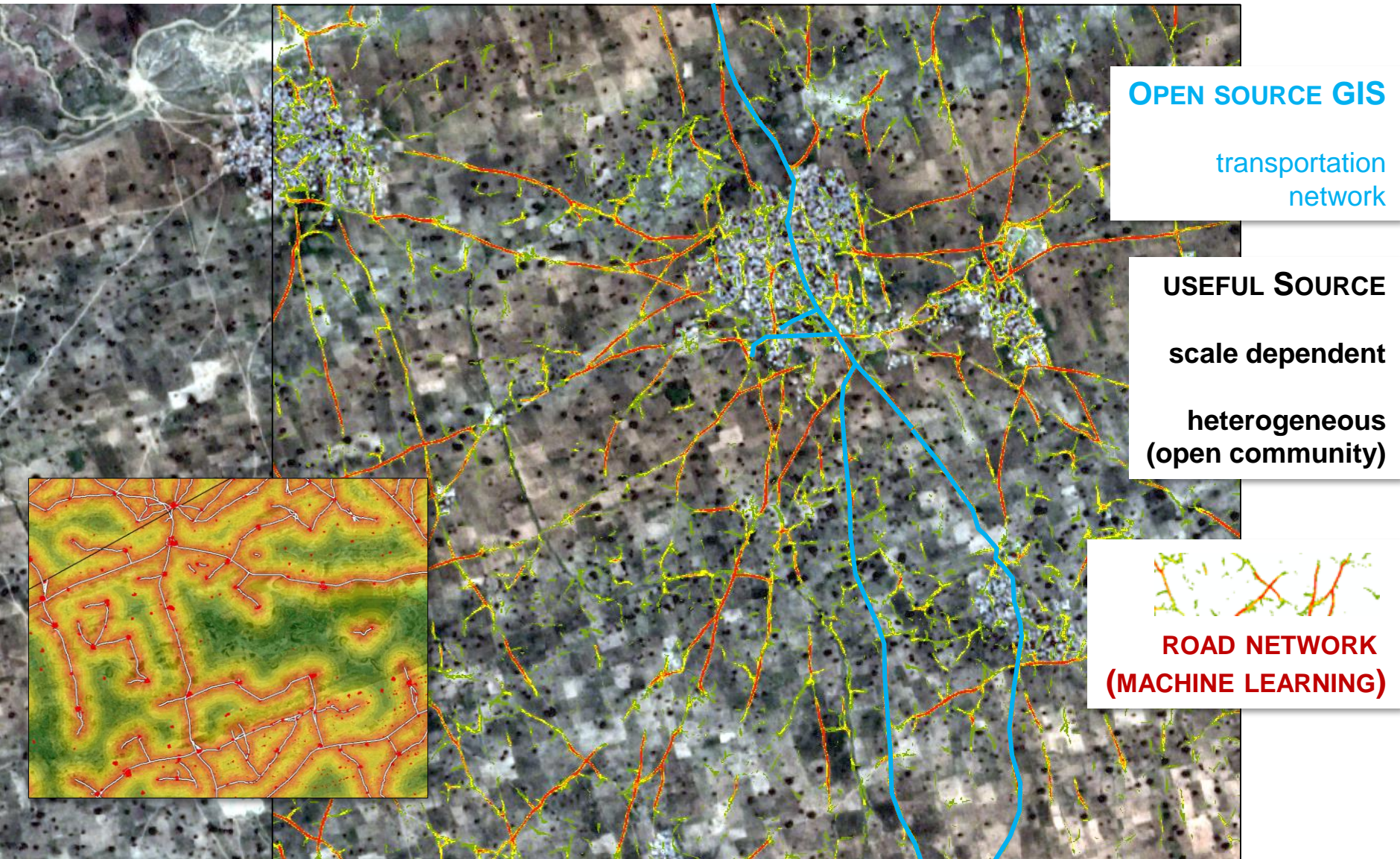
distribution & network
... accessibility

People

Resources

Risk

Machine learning for a fast overview



Earth Observation Examples

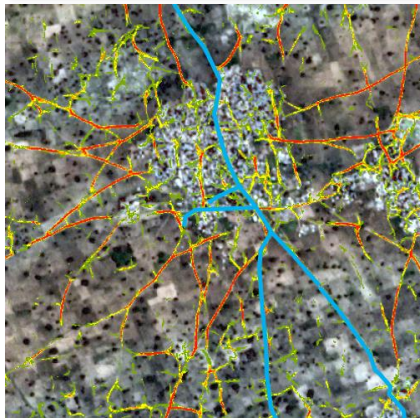


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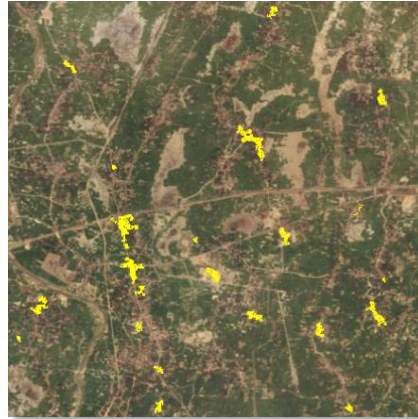
Infrastructure



distribution & network
... accessibility



People



urban footprint & type
... number of users

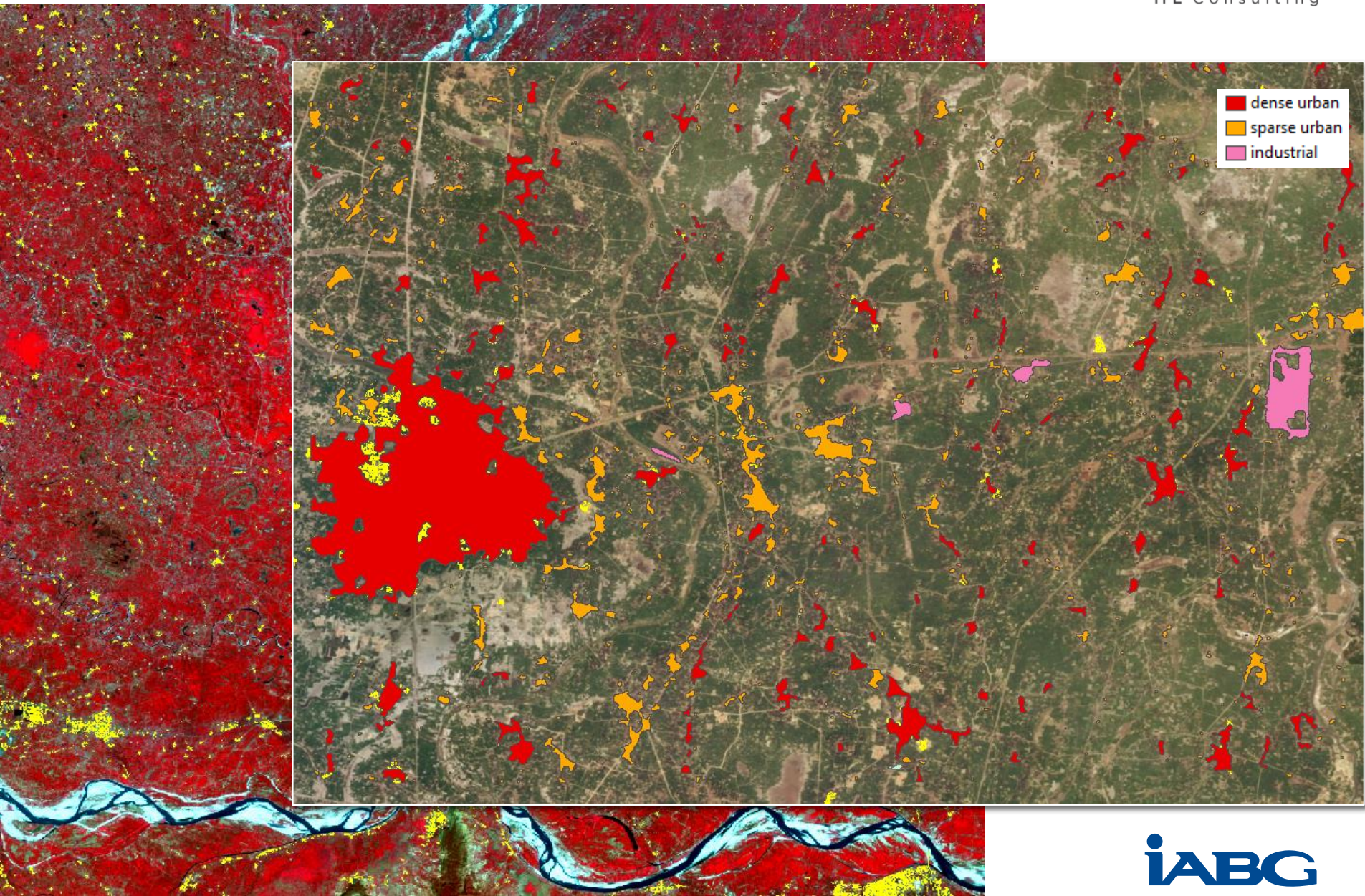
Resources

Risk

Open data sources – Global Urban Footprint (80/12m)



TFE Consulting



Earth Observation Examples

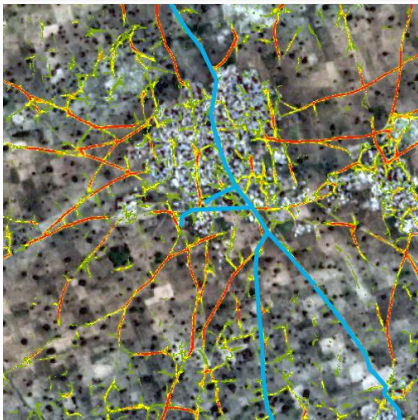


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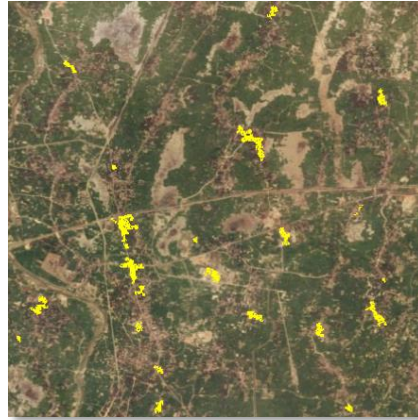
Infrastructure



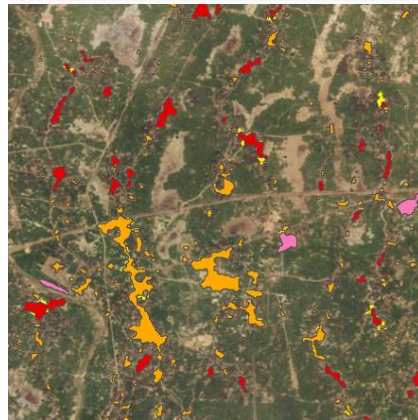
distribution & network
... accessibility



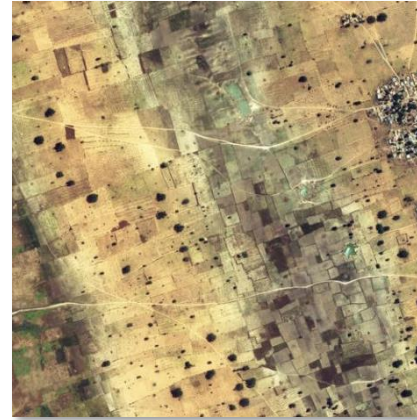
People



urban footprint & type
... number of users



Resources



annual change & use
... production type

Risk



2017/09 x 10 x 11 x 12 x 01 x 02 x 03 x 04 x 05 x 06 x 07 x 08 x 2018/09



potential class	J	F	M	A	J	J	A	S	O	N	D
vegetation typ constant – TREES											
vegetation typ dense (long veg. period) – CROP1											
vegetation typ dense (short veg. period) – CROP2	no data		no data	no data			no data		no data		
vegetation sparse (long veg. period) – CROP3											
vegetation sparse (short veg. period) – CROP4											
no vegetation – ARTIFICIAL, WATER, ROCK											

VITAL
LESS VITAL
NON VITAL

- trees
- crop types
- with different vegetation
- characteristics (within one year)

Satellite image (10m) analysis of vegetation vitality

Earth Observation Examples

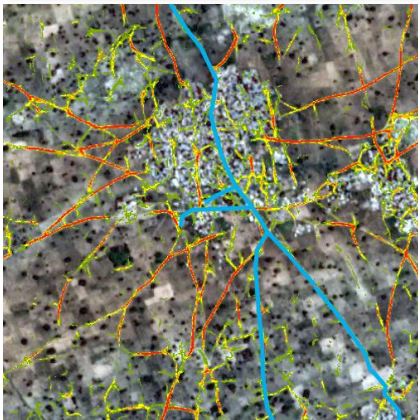


TFE Consulting

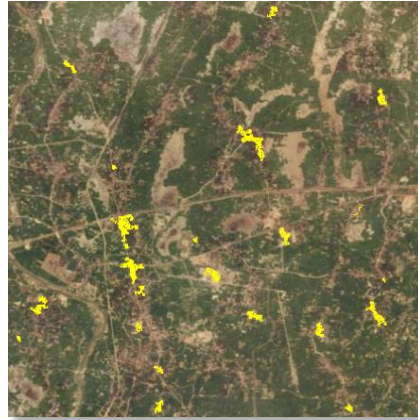
Infrastructure



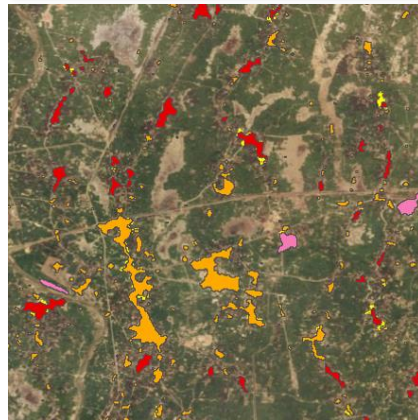
distribution & network
... accessibility



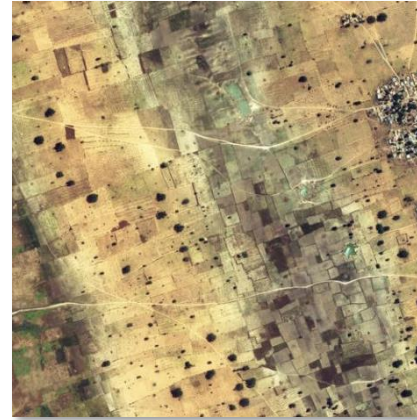
People



urban footprint & type
... number of users



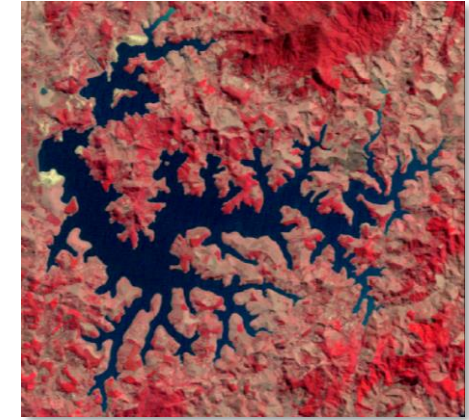
Resources



annual change & use
... production type



Risk

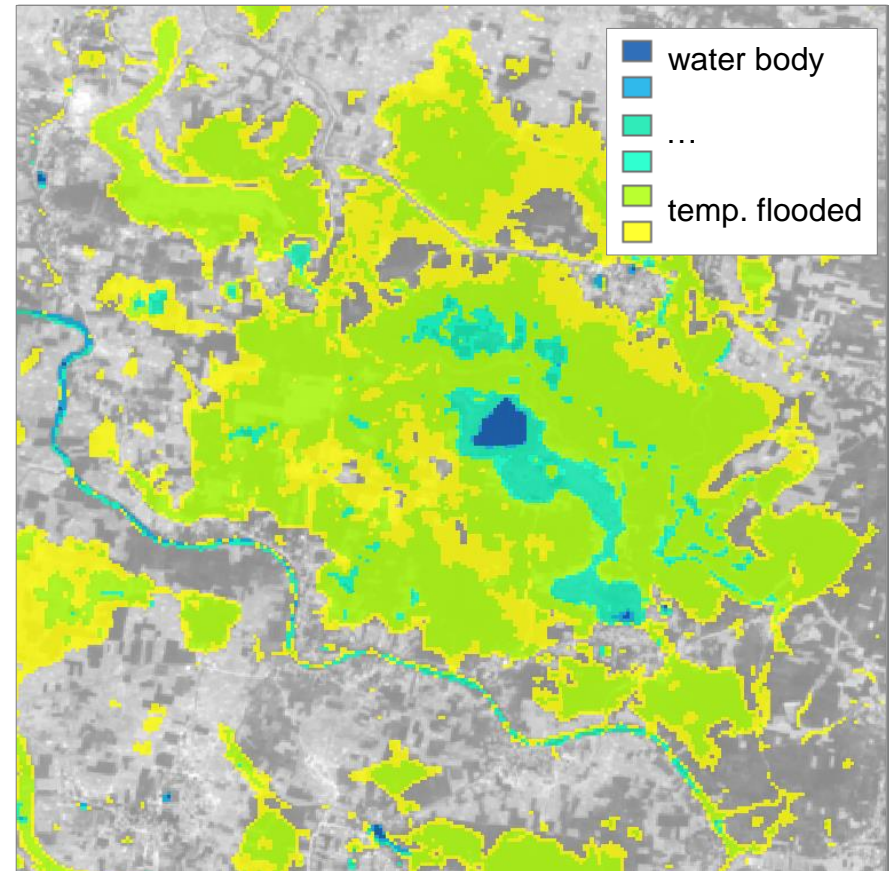
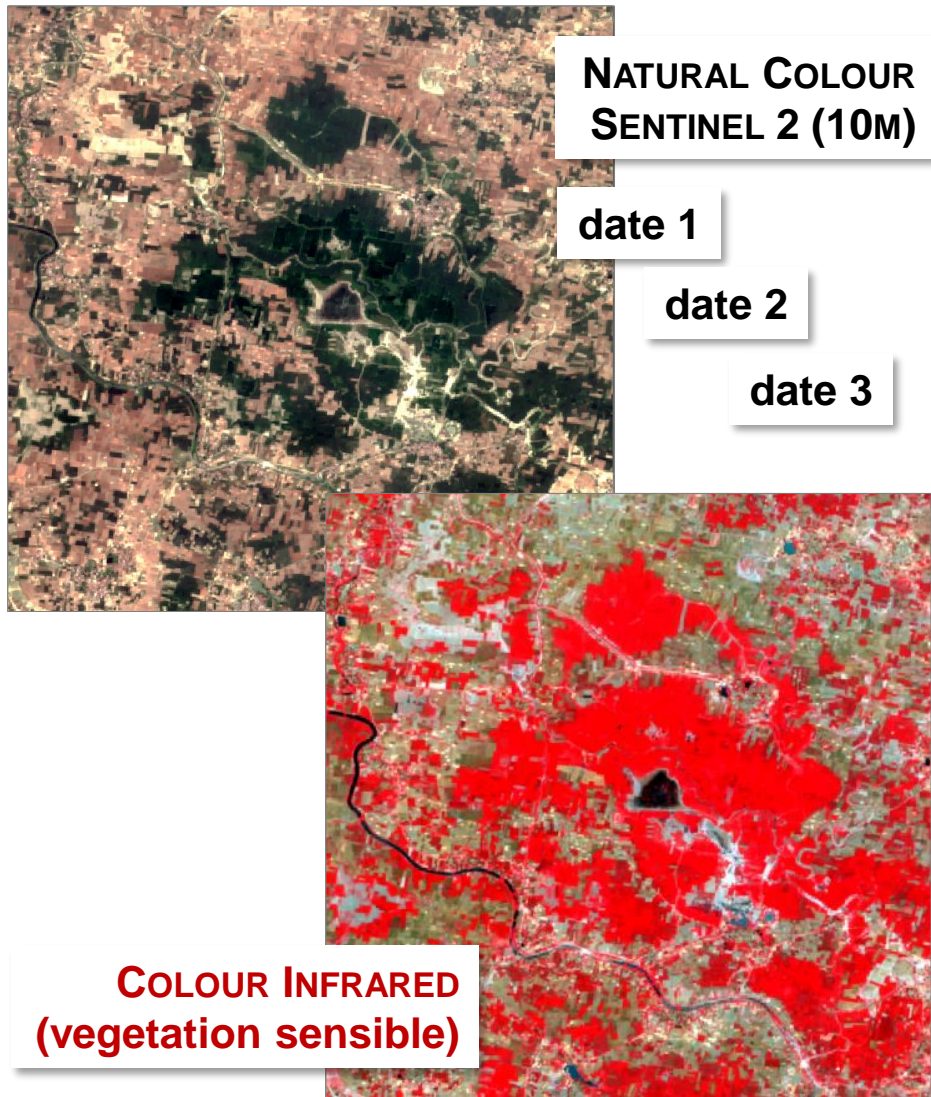


hazard type & variance
... temporal change

Risk of flooding



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Earth Observation Examples

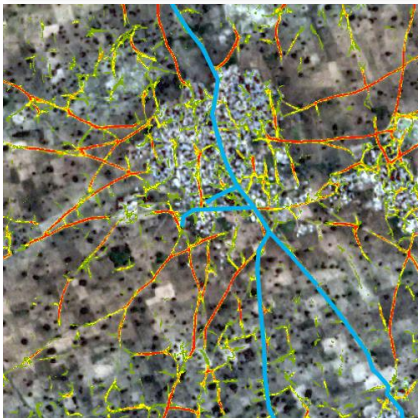


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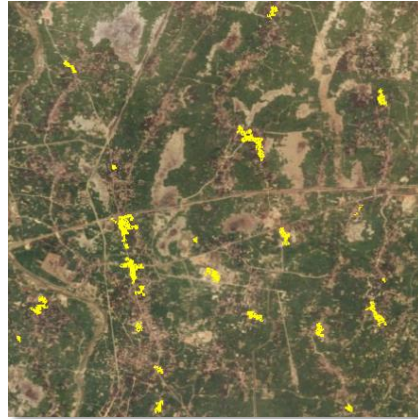
Infrastructure



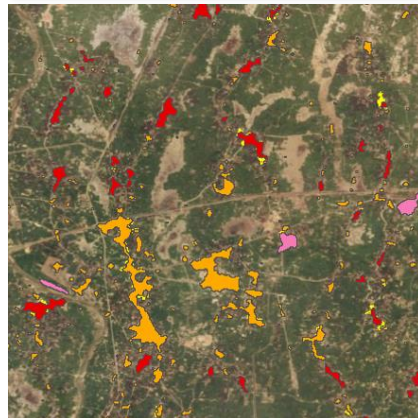
distribution & network
... accessibility



People



urban footprint & type
... number of users



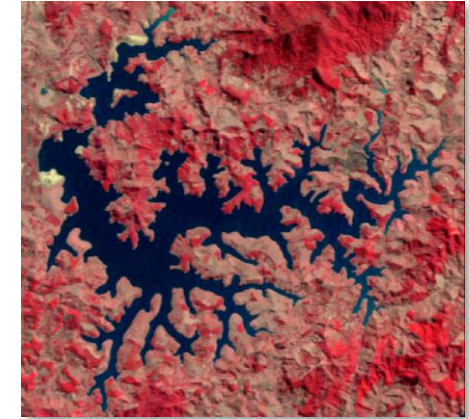
Resources



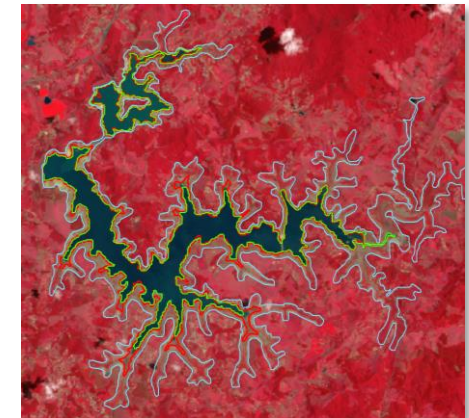
annual change & use
... production type



Risk



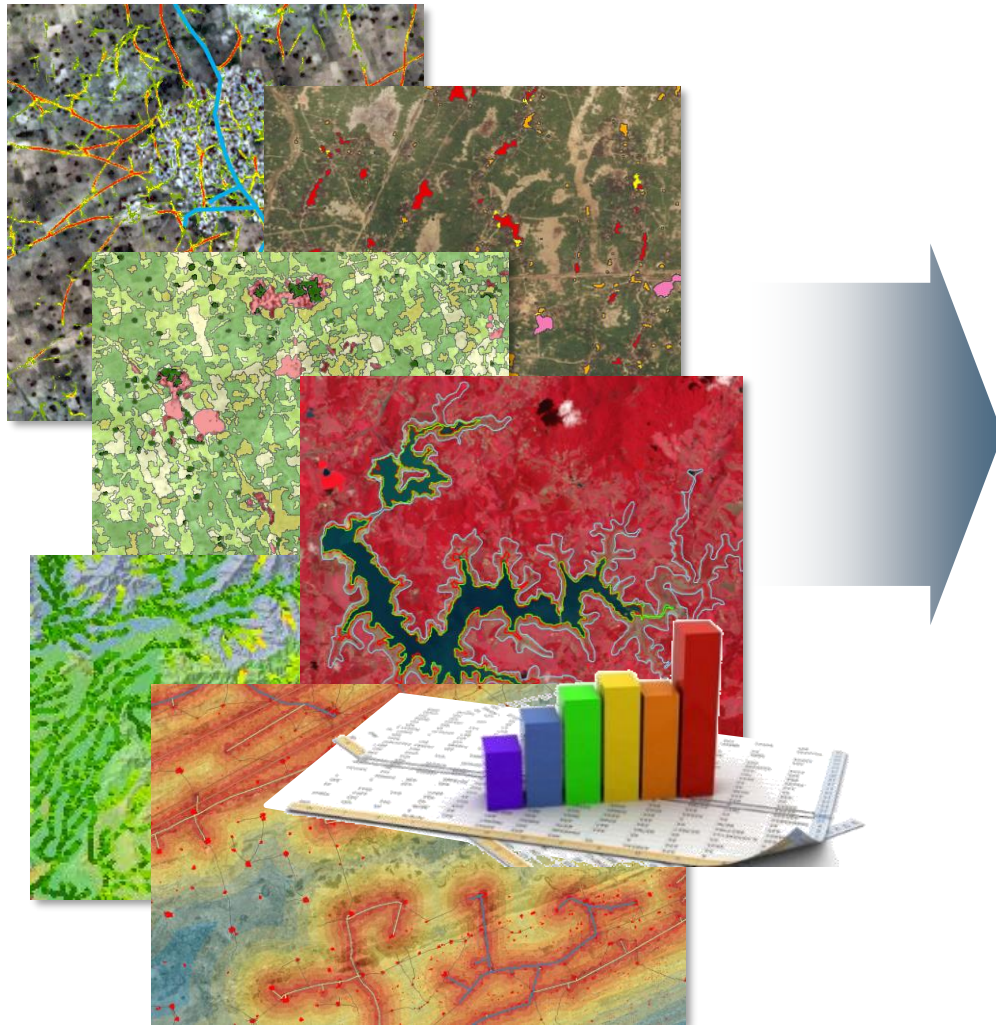
hazard type & variance
... temporal change



Earth Observation Examples become part of the Solution



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Interests	DEVELOPER
Possibilities	Requirements
Experience	

MICROGRID

... or any other energy installation

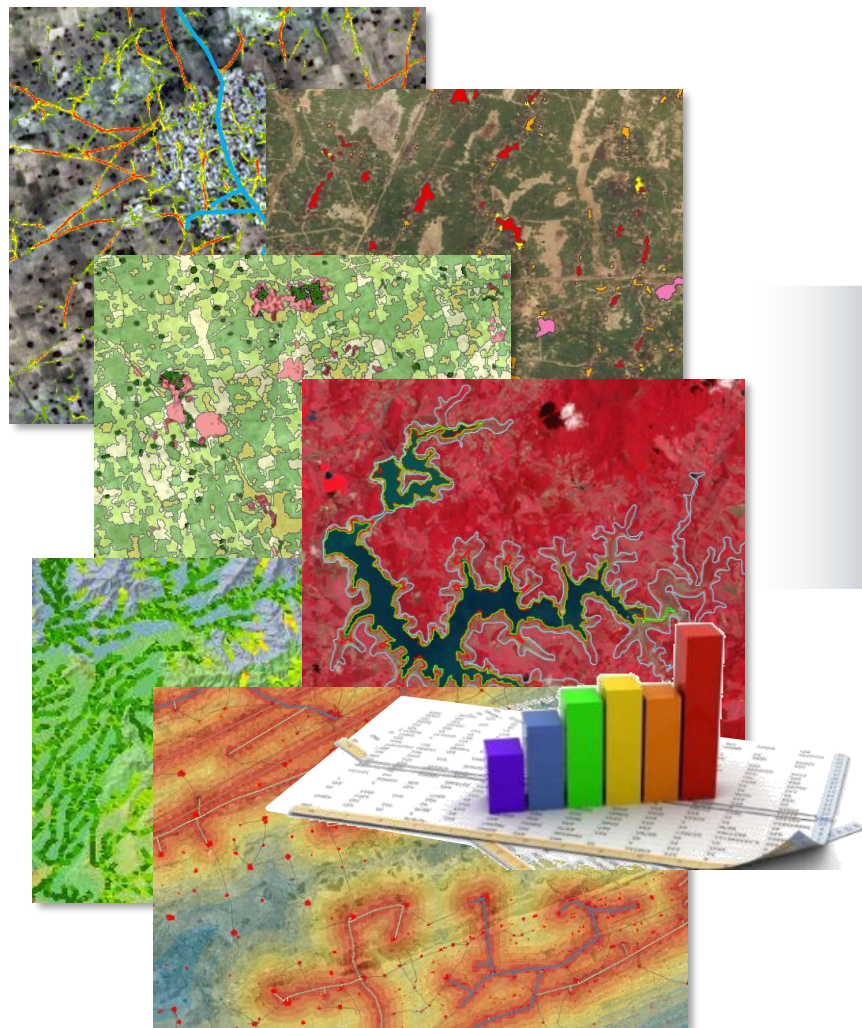
Site Identification as a function of

- Village size
hamlet ... city
- Accessibility
infrastructure distance
- Ressources
dominant size of fields
potential crop type, ...
- Risk
natural flooding
drought
- Other aspects

Earth Observation Examples become part of the Solution



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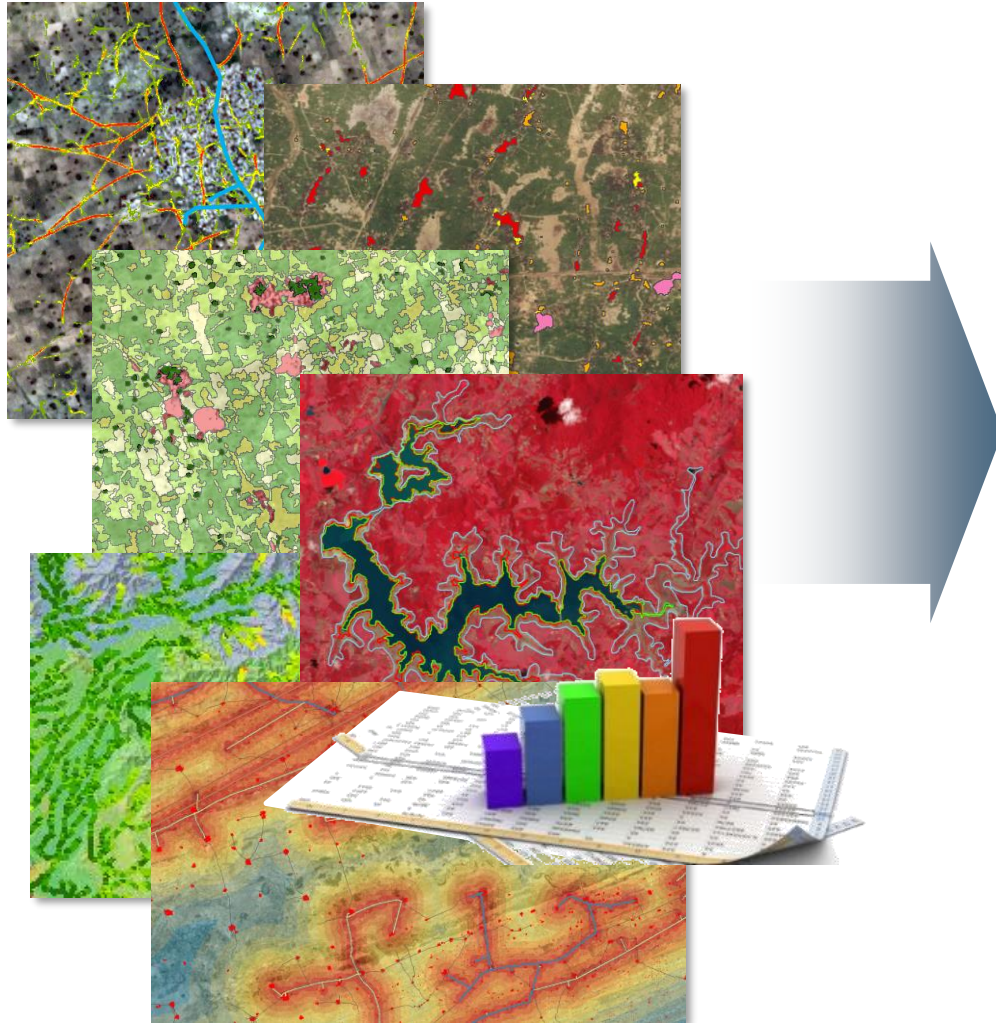
MICROGRID
... or any other energy installation

predicted Sites

Earth Observation Examples become part of the **Solution**



TFE Consulting



- up-to-date information is important & can be cost-effective (Use Cases)
- provides new solutions (not considered so far)
- HR Sentinels allow to analyse large areas to comparably low costs and high homogeneity

*in order to settle the services
... collect developers requirements
QUESTIONNAIRE*

... LETS CREATE THE WHOLE PICTURE
THANK YOU FOR YOUR ATTENTION



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EXPO BOOTH
14.17 A

MICROGRID
INDIA

