

# Observations & Science

FUTURE EARTH WATER-ENERGY-FOOD NEXUS WORKSHOP  
Pietermaritzburg, South Africa, 21-23 November 2016

# Questions #1: Needs in order to manage WEF

- Lack of information in public space e.g. from Mining industry, but should be released under free information act (South Africa)
- Facilitating the exchange of information regardless being good or news
- Biggest challenge climate data – weather services need to generate income to fund staff, stations etc.
- When available often restricted in terms of stations, resolution etc.
- SA: If funded by public funds – data need to be public. Project specific activities working on an understanding how data can/should be shared.
- EO open and free data – but information not free

# Question #2: Science questions to reduce uncertainties

- Often work in pillars (water, food, energy) need to work on innovative and integrative solutions
- Show implications/impacts on e.g. food production, water supply, energy cost
  - BAU vs. through scenarios
  - "Watches" concept and MAPS (mitigation and planning scenarios)
- Intergated models working on the different trade-offs
  - How do we integrate different data types, sensors?
- Risk framework – e.g. Risk hot-spots (climate change)

# Question #3: Benefits from information integration

- Government more reactive than long-term planning
  - User friendliness e.g. "Pixi" publications, policy brief
- Private sector: Financial viability, CSR, public perception
  - Risk profiles – will this be negatively perceived local, national, internationally
  - Specifically: Mining, energy, forestry
- Land use trends (mapping and modelling) e.g. Bush encroachment (carbon, fuel, GW water impacts)
  - CO2 fertilization, changing fire regimes
  - Use forestry for carbon sequestering, may not always be the best in a WEF Nexus context

# Questions #4: Earth Observation support

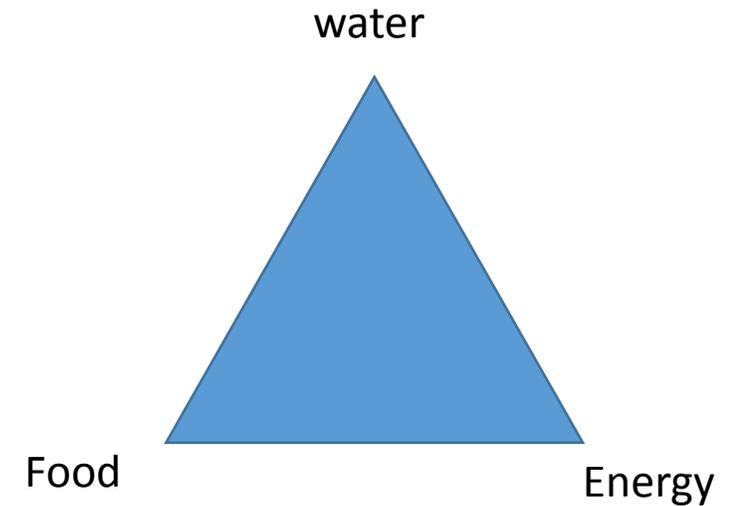
- EO – how accurate?
  - Large portfolio of products which has been validated, but difficult to cover all environments
  - Global standard products available (rainfall, vegetation, soil moisture)
    - Even if not perfect – sometime only information use
- Always looking for opportunity to get more ground data
  - citizen science could help
- The challenge is the process on how to turn data into information
  - Algorithms
  - Volume
  - ...
- Mining: Water extraction, water quality, vegetation health
  - Sentinel resolution

# Question #5: Information system needs

- Integrative modelling, Adoptive Risk framework
- Links to socio-economic data
  - Africa generally national (HDI, WB indicators)
  - South Africa finer level
- EO can help to downscale:
  - Population (night light, build-up)
  - VHR data – for urban characterisation (informal settlements, building inventory)
- Looking towards industry for information (e.g. Farmacia, electricity use, seed sales) – scope for a pilot project?

# Question #6: Merging models

- National indicator framework:
  - Water -> water supply
  - Food -> net export
  - Power -> capacity in MW,  
ratio renewable to coal/fossil capacity
- Different triangles for different scenarios to



# Question #7: Citizen science

- Weather stations, campaign towards schools
  - Monitored by teacher/Kids
  - Has longevity
  - QA because used in science projects
- App for water leakages!
- Examples Energy, Agriculture
  - Household energy supply, online anonymous submit usage
- Making better usage of existing open source projects (e.g. OSM)