



FoodTech for Sustainability

Leveraging Digital Technology to Empower
Smallholder Farmers

EUI/Assonime workshop, 20 September 2019

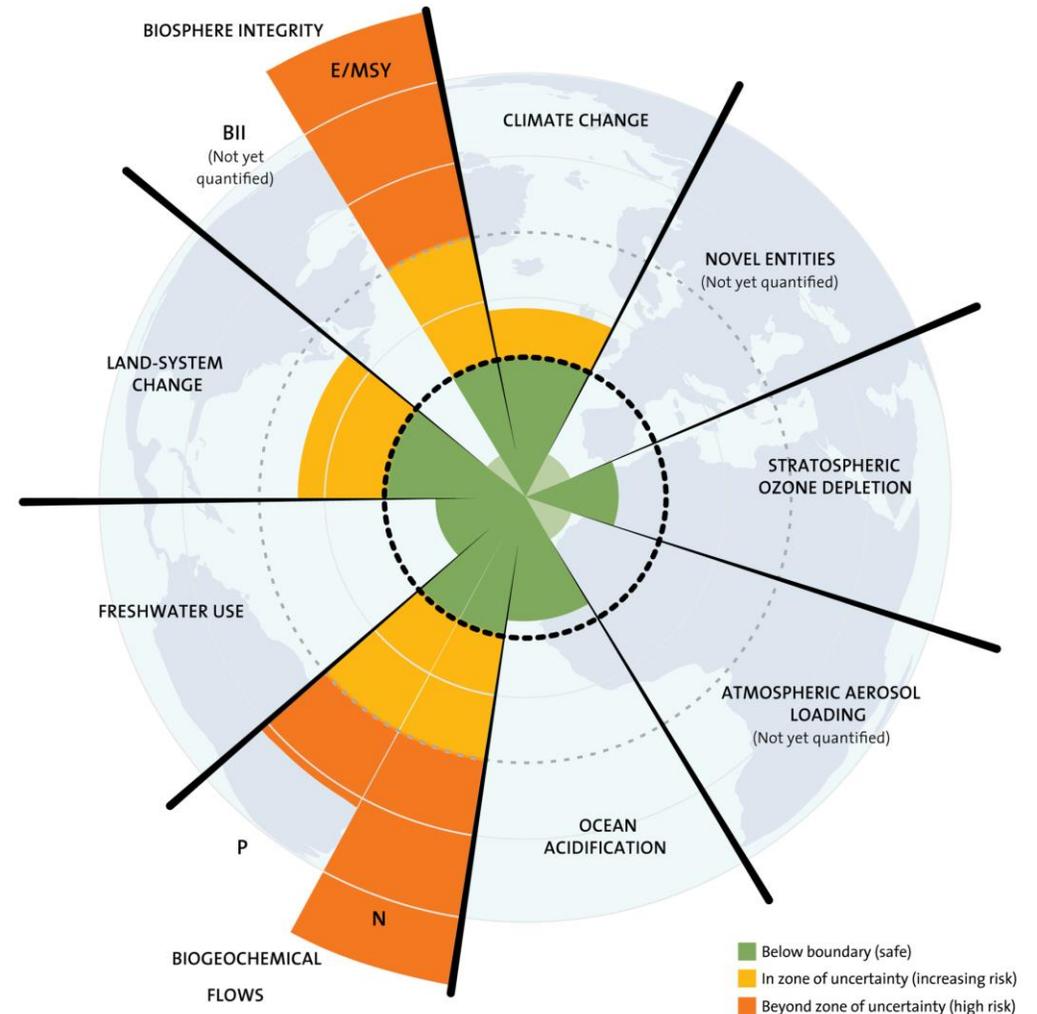
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Sustainability challenges driven by agriculture

Current situation

- World's population is growing, estimated to reach between 9-10 billion by 2050
- 820 million people globally today who don't have enough to eat
- Major loss of biodiversity, pushing the planet outside its boundaries
- Ag uses 30% of arable land and 75% of fresh water
- Agriculture represents the bulk of GHG emissions, majority of nitrous oxide emissions $\approx 300x$ more poisonous than carbon dioxide

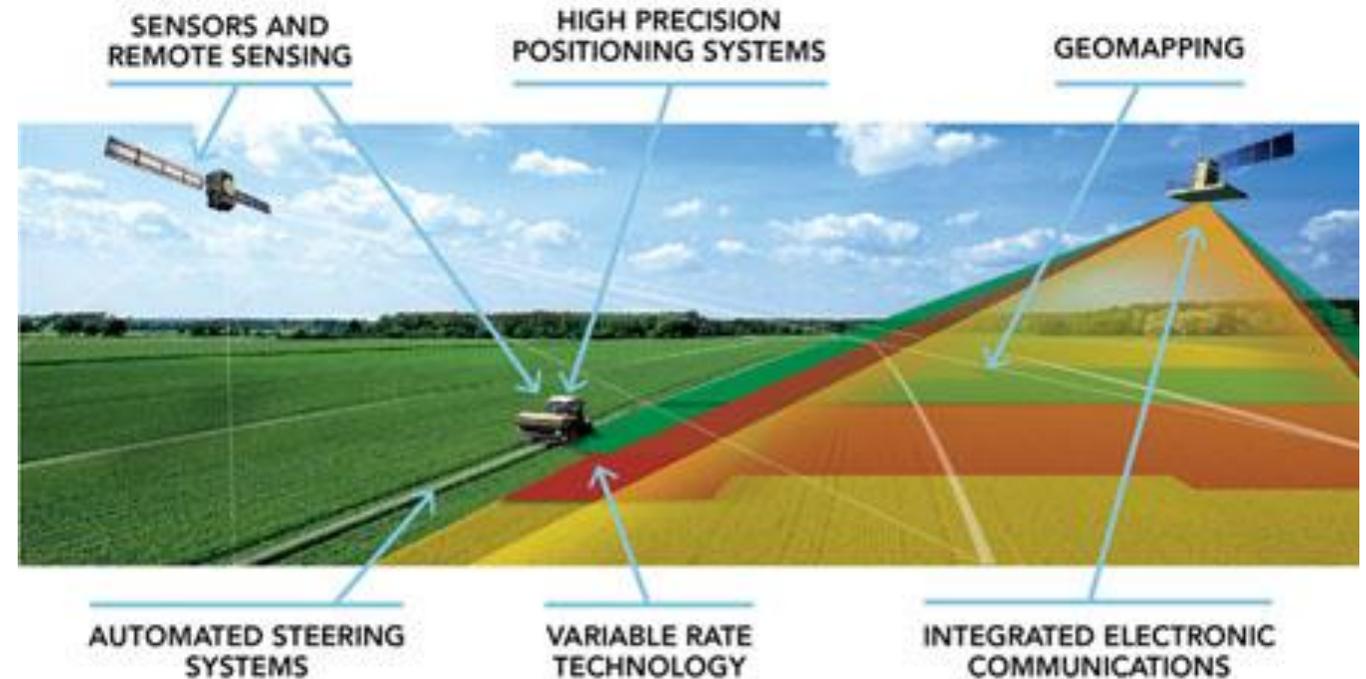
Agriculture and food are major drivers of these developments



Source: Campbell et al. (2017)

Digital Tech and Big Data Enable Efficiency

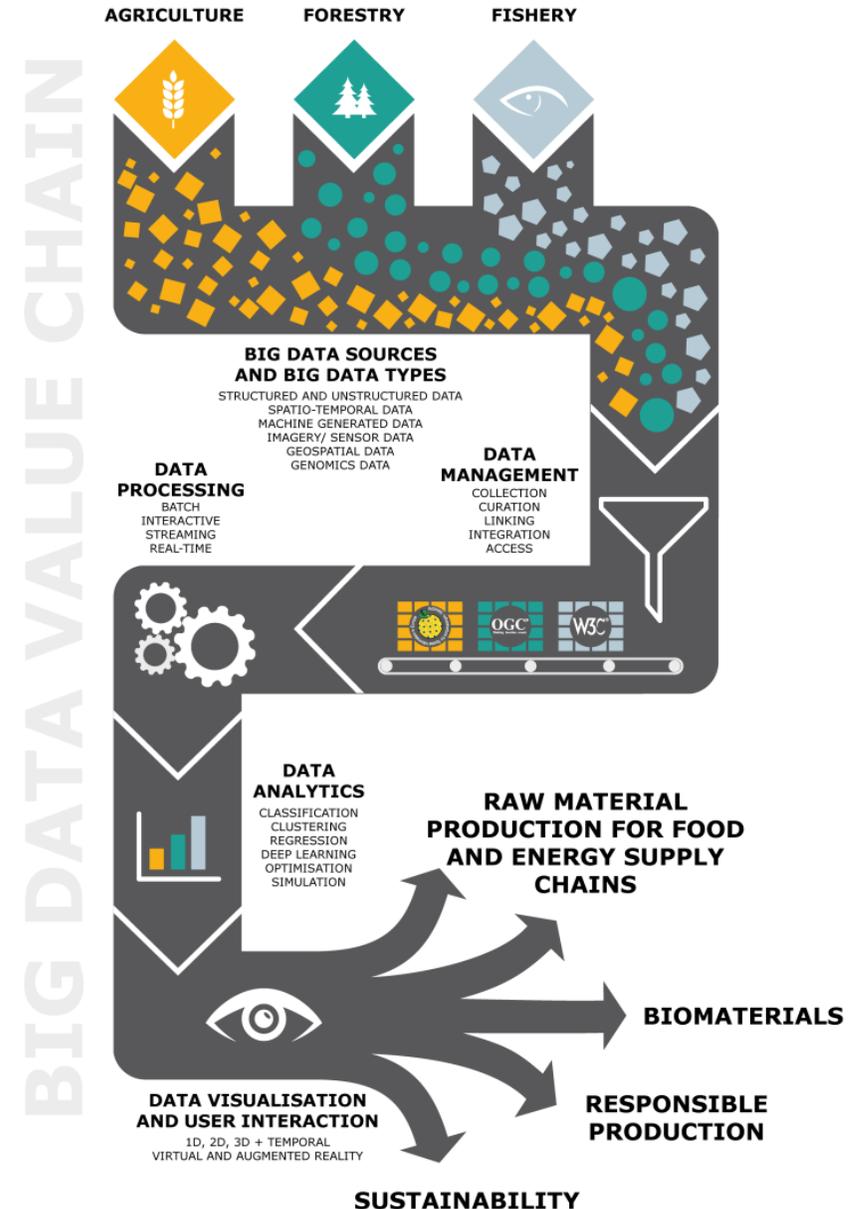
- Precision Ag: maximize yield, reduce inputs, use less resources
- AgTech stack: data, IoT, block chain, ML, AI, sensors, satellite imagery, cloud computing
- Gathers and analyses data for better decision making



Source: CEMA

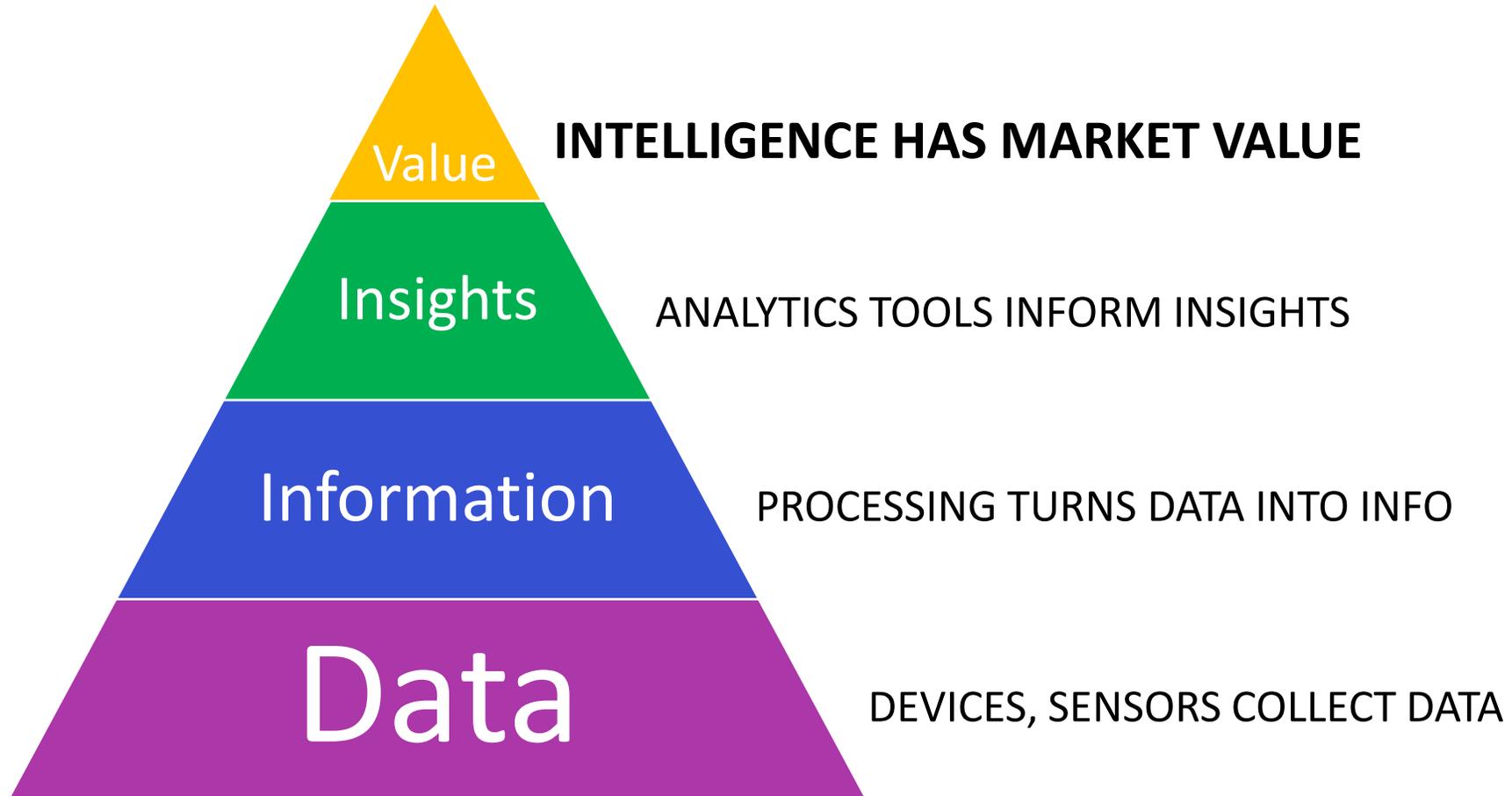
Collect and Analyse the Data

- Data is the key to unlocking insights
- Hardware gathers data, analytics give data value
- Measure conditions – soil moisture, chemistry, sunlight
- Precise measurement avoids the need for uniform spraying of pesticides
- Digital tools enable real-time monitoring
- Apply analysis tools to predict outcomes: AI, ML
- Can help identify pests, disease, animal welfare



Source: DataBio, a Horizon 2020 Lighthouse project

Digital Farming: Value Derives from Data



Digital Farming: New Digital Divide?

- Most of the world's agricultural land operated by smallholder family farms
- Smallholder farmers produce most of the world's food
- Farmers generate the most farming data, but are least likely to understand its value
- Farmers are fragmented group politically, at risk of being left behind in digital ag age
- Potential result: less innovation in sustainable farming and continued environmental degradation



Conclusions

- Data can support better decision making but we need to support smallholder farmers in making the most of it
- Opt-in giving permission to use data is insufficient, must be paired with capacity building for skills to understand value of data and how it can be created, used, shared, and most important – **valued**
- Need fair data governance for all actors in the value chain, especially smallholder farmers
- Policy challenges remain around the concepts of data governance, standards, privacy, data ownership and what constitutes intellectual property. Requires a neutral space where all stakeholders are able to participate in finding solutions