Horticultural Lighting Value Metrics

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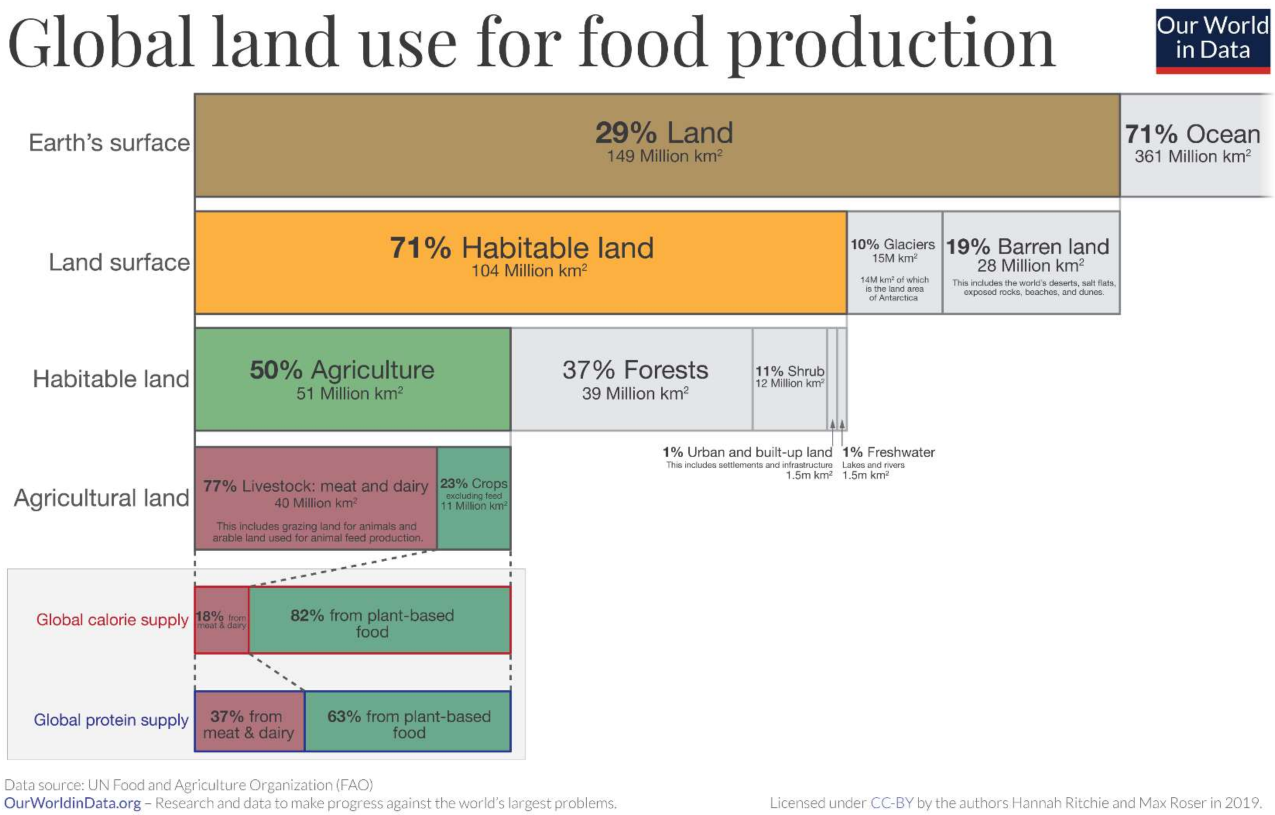
- Date

Arable land for food production is limited



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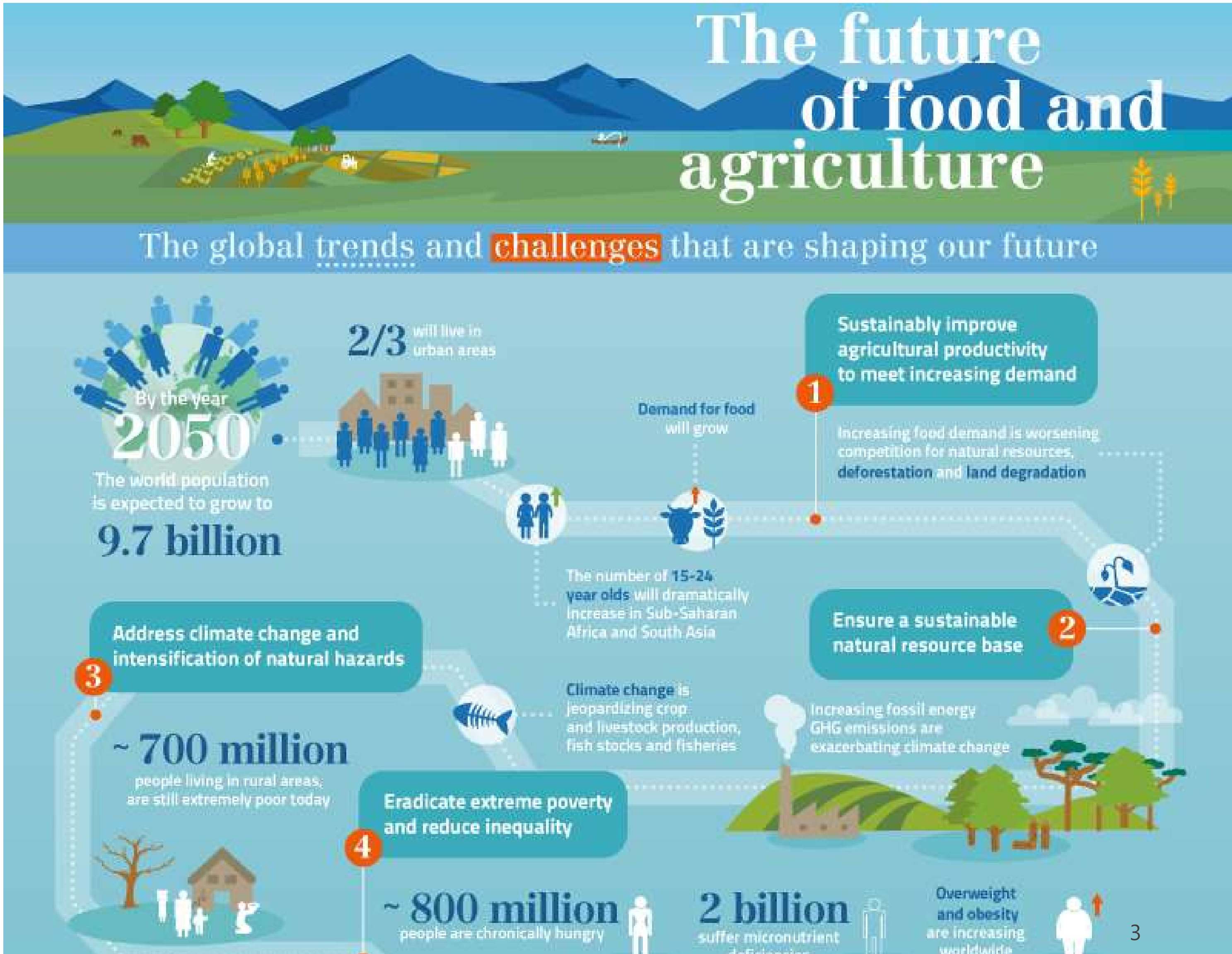
Food demand is growing and so are the challenges



http://www.fao.org/resources/infographics/infographics-details/en/c/471471/

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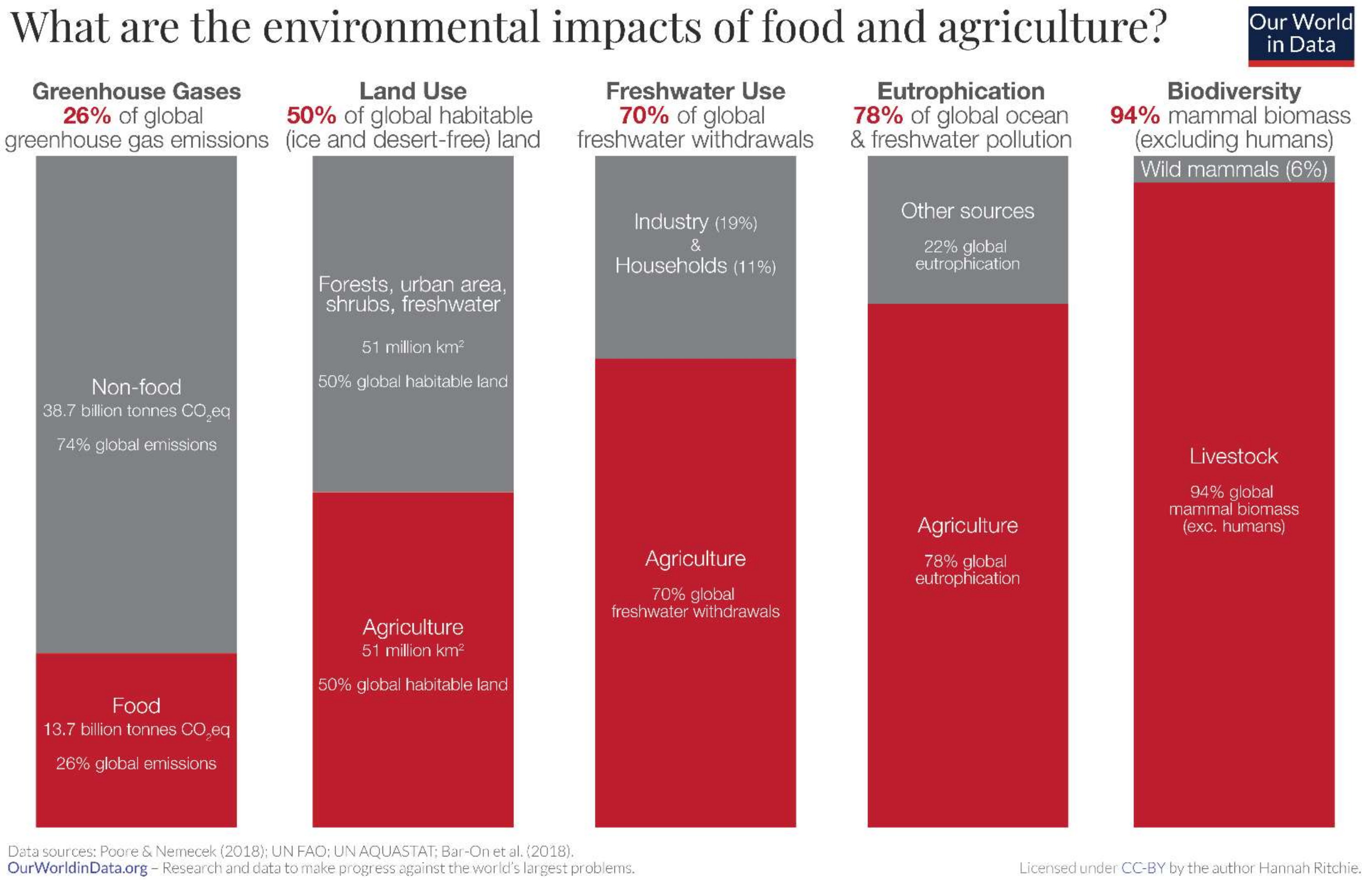
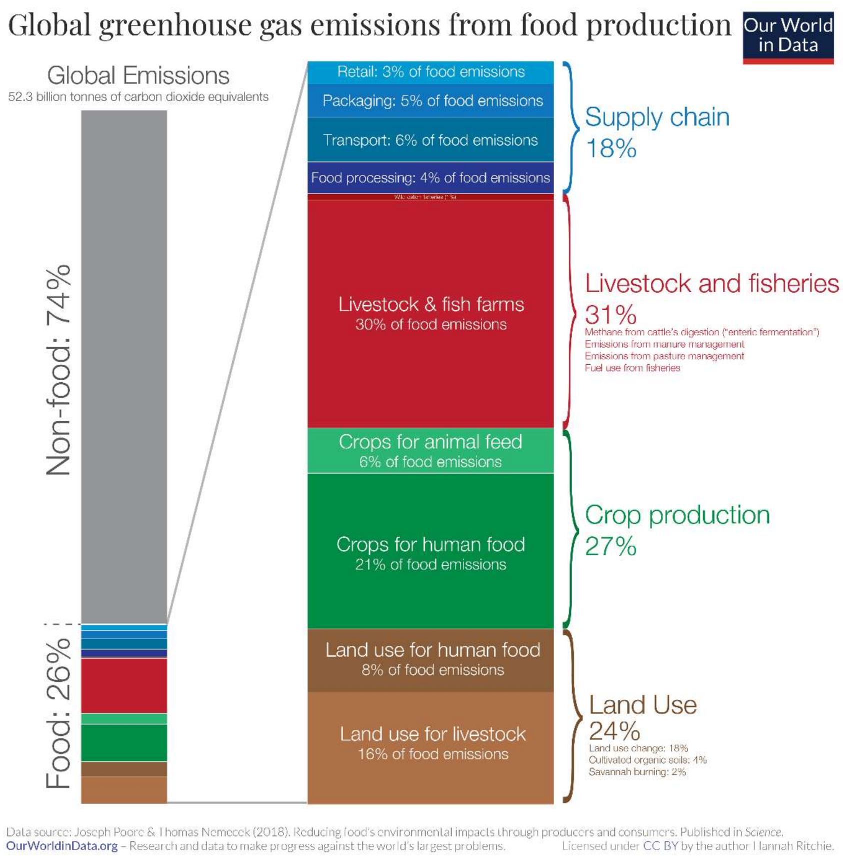
We need to minimize our negative impacts



Including greenhouse gas emissions



CEA is part of the solution

- Year-round production
- Weather-resistant facilities
- Lower-water usage, but potentially high energy loads
- May decrease food waste

What can lighting do?

The current state of the art

- Photosynthetic Photon Flux Density (PPFD) rather than Illuminance
  - Dose dependent production – Daily Light Integral (DLI) based on cultivar and quality
  - Production is dependent on light quantity and quality
- In CEA, lighting is a process load – crops need light to grow
  - LED is the most efficacious photosynthetic light source
    - currently up to 200% more efficacious than best performing DE HPS fixtures (≈1.7 μmol/J)
    - up to 400% more efficacious than MH or fluorescent fixtures

Product performance

DLC's Horticultural Lighting QPL helps stakeholders identify high-quality, energy-efficient products.

Listed products must meet minimum efficacy, component life, safety and other DLC performance requirements.

As of January 13, QPL includes 241 products from 67 manufacturers

Incentives and regulations affect market transformation

- Efficiency programs across North America are incentivizing changeover to LED horticultural lighting
  - Concern with high energy use, especially for cannabis crops
  - Non-uniform baselines, incentives and metrics
- State regulations for (mostly) cannabis facilities are also resulting in increased LED lighting installations

Future value metrics

- Nutrition
- Flavor / Aroma
- Pharmaceutical compounds
- Pest mitigation
- Freshness

https://pixabay.com/photos/greenhouse-organic-farming-2139526/

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The DLC® drives efficient lighting by defining quality, facilitating thought leadership, and delivering tools and resources to the lighting market through open dialogue and collaboration.

Thank you