



ASIA AND THE PACIFIC **FOOD SECURITY FORUM 2024**

Investing for the Future of Climate–Food–Nature
9–12 April 2024, ADB Headquarters, Manila, Philippines

ADB

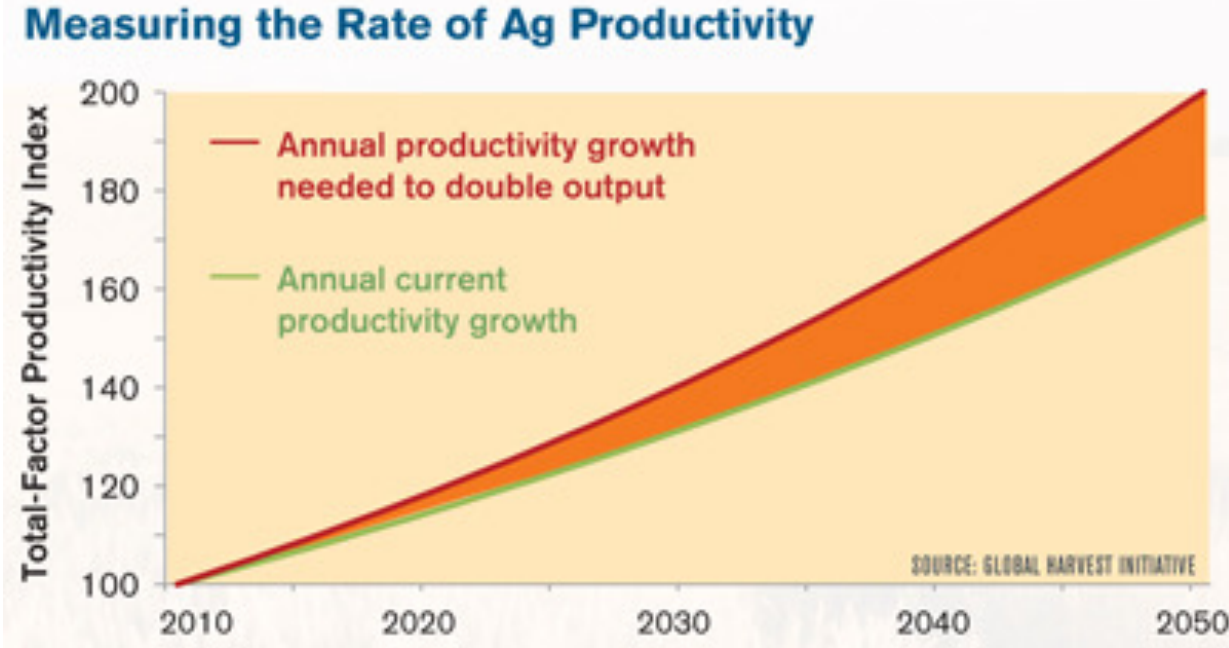
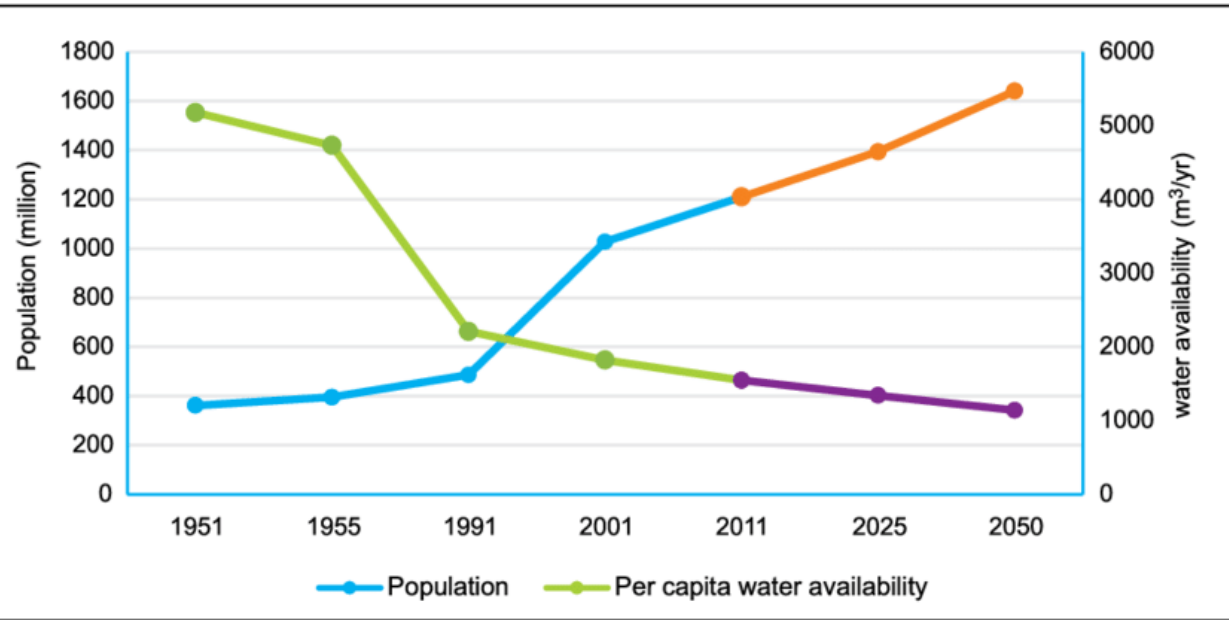
Crop Response to Changing Climatic Conditions

How satellite measurements can assist to detect resilient cropping systems

Wim Bastiaanssen
Ambassador IrriWatch
Hydrosat

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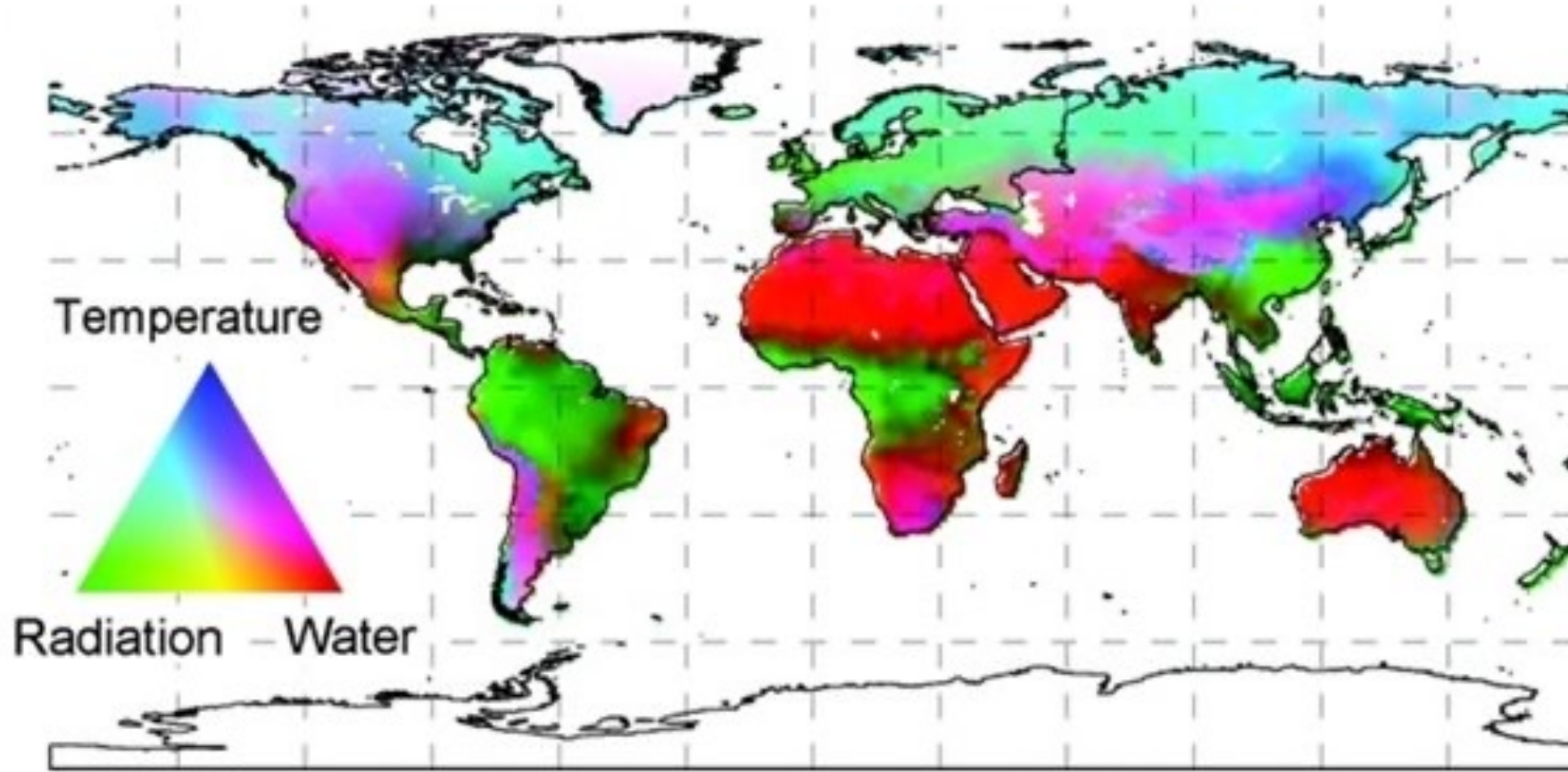
How can we nourish the future ?



Increasing water productivity is a necessity



Climate constraints to food production



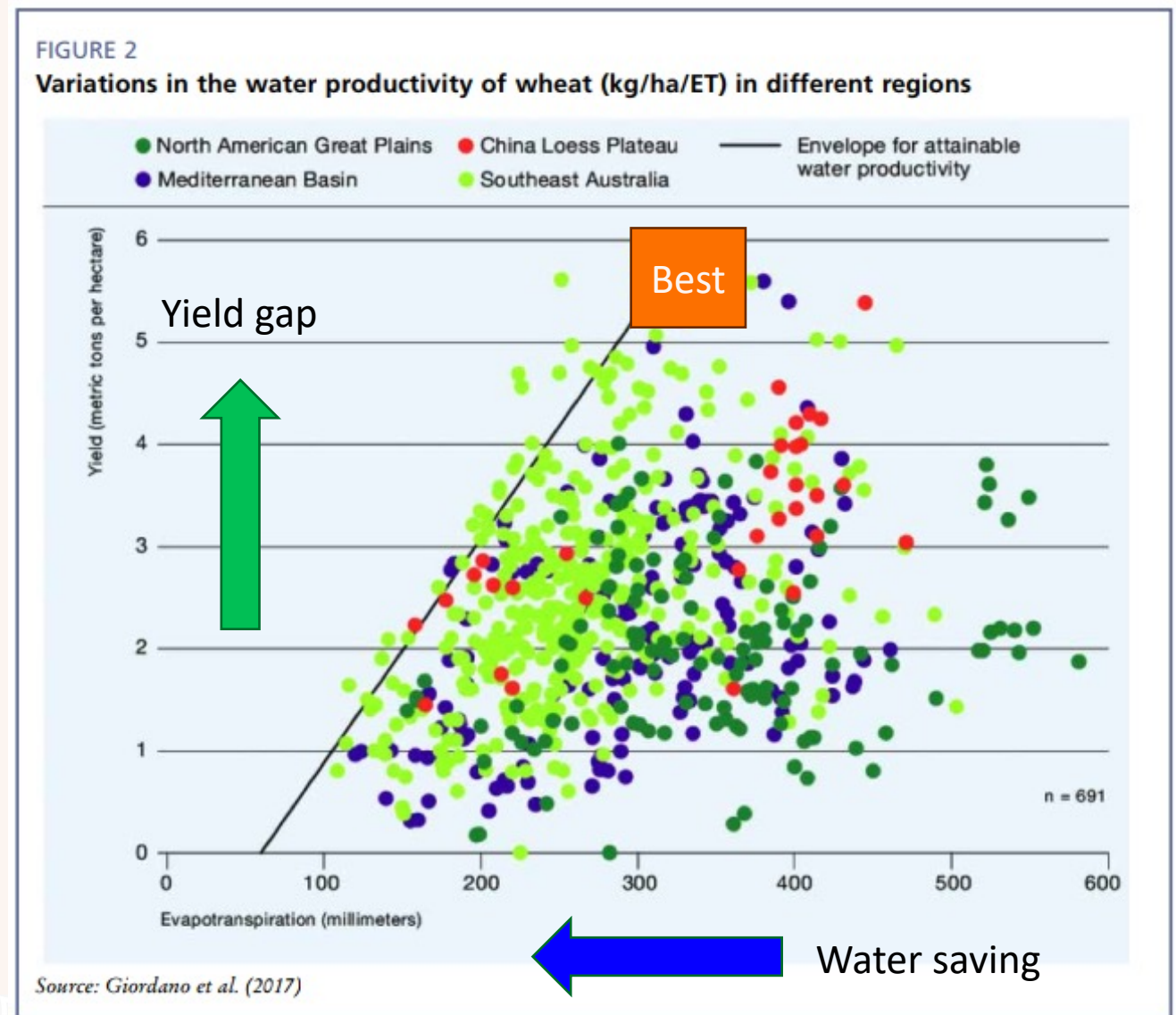
The problems of water and temperature are worsening.
We need to find ways to save water and become more resilient to heat

Yield and Water Productivity Gap



There exists a yield and water productivity gap

Policies and interventions for closure can be developed if a proper measurement system is in place



There is a need for daily thermal satellite measurements



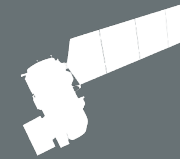
High resolution images can measure crop temperature and infer photosynthesis and ET

IrriWatch Daily Service

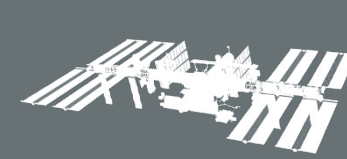
CURRENT INPUTS



SENTINEL-1, 2, 3
(ESA)



LANDSAT 8, 9
(NASA)



ECOSTRESS
(NASA)



VIIRS
(NOAA/ NASA)

Example from Mohanpura, India, 11 March 2022

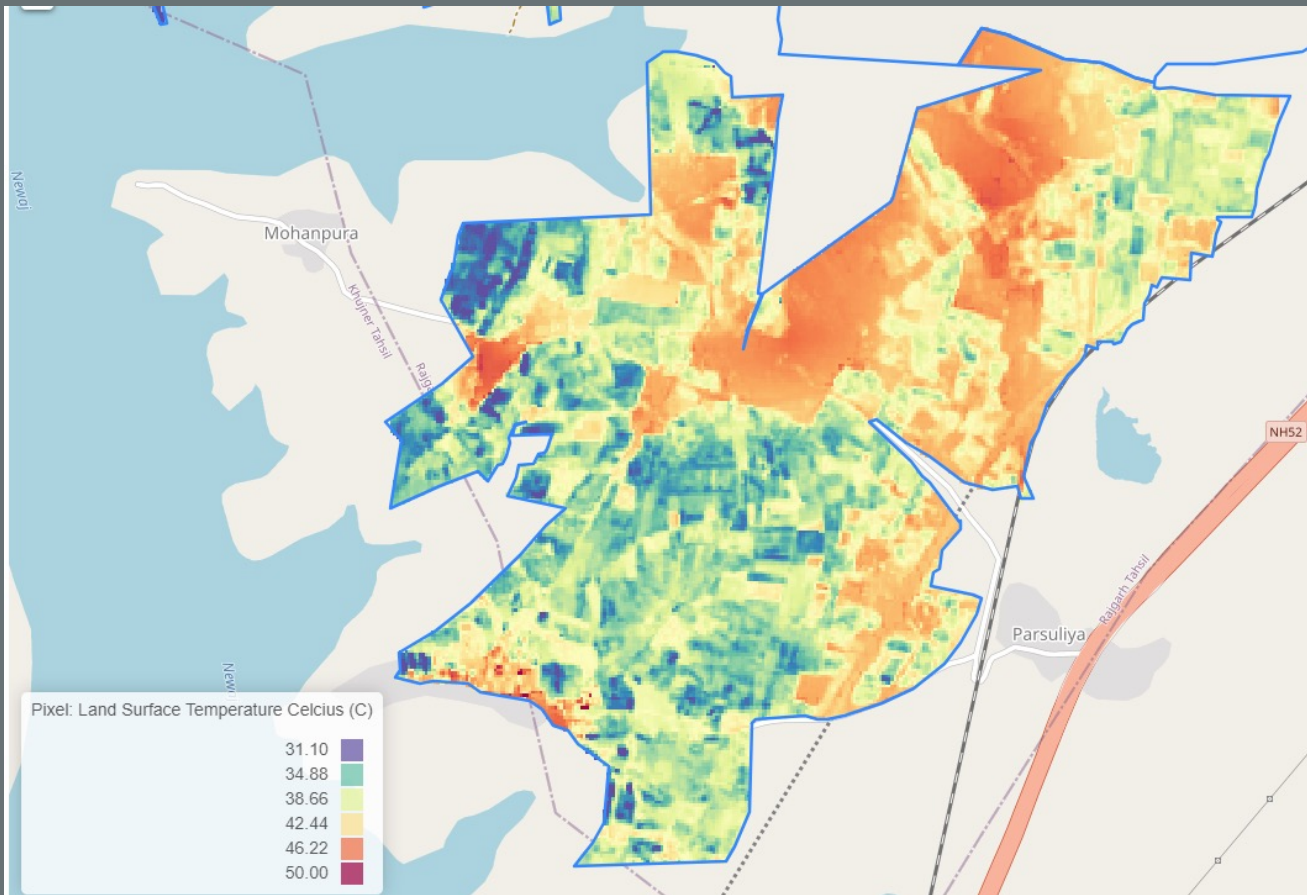
OUTPUTS

SPECIFICATIONS

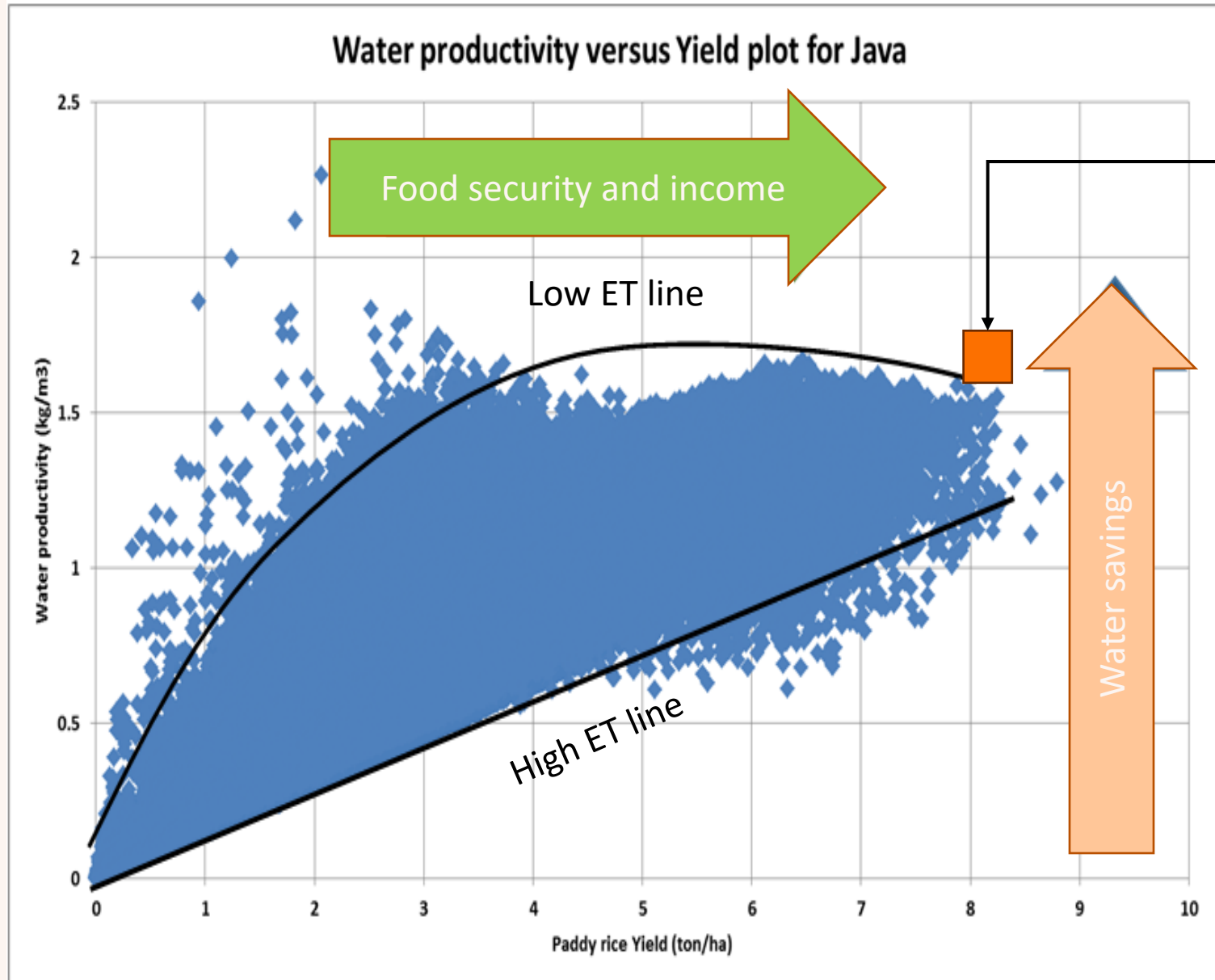
- 10m Spatial Resolution
- Daily Data Frequency
- Global Coverage
- Data Archive to 2017

QUALITY

- Science Quality Calibration
- Analysis Ready
- CEOS CARD4L Product Family



Optimizing WP and income

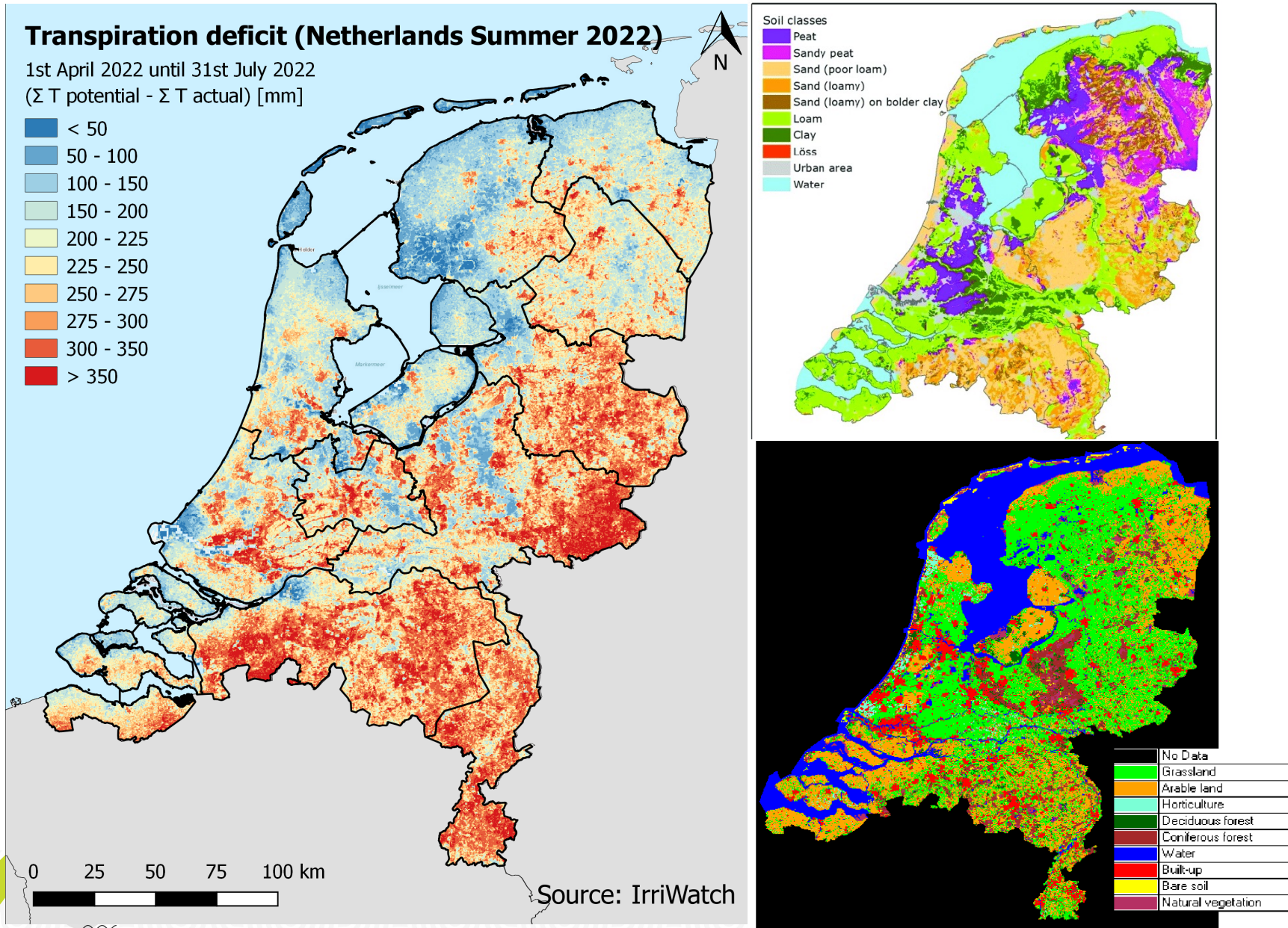


Analyse target level

Define practices **hero farmer**



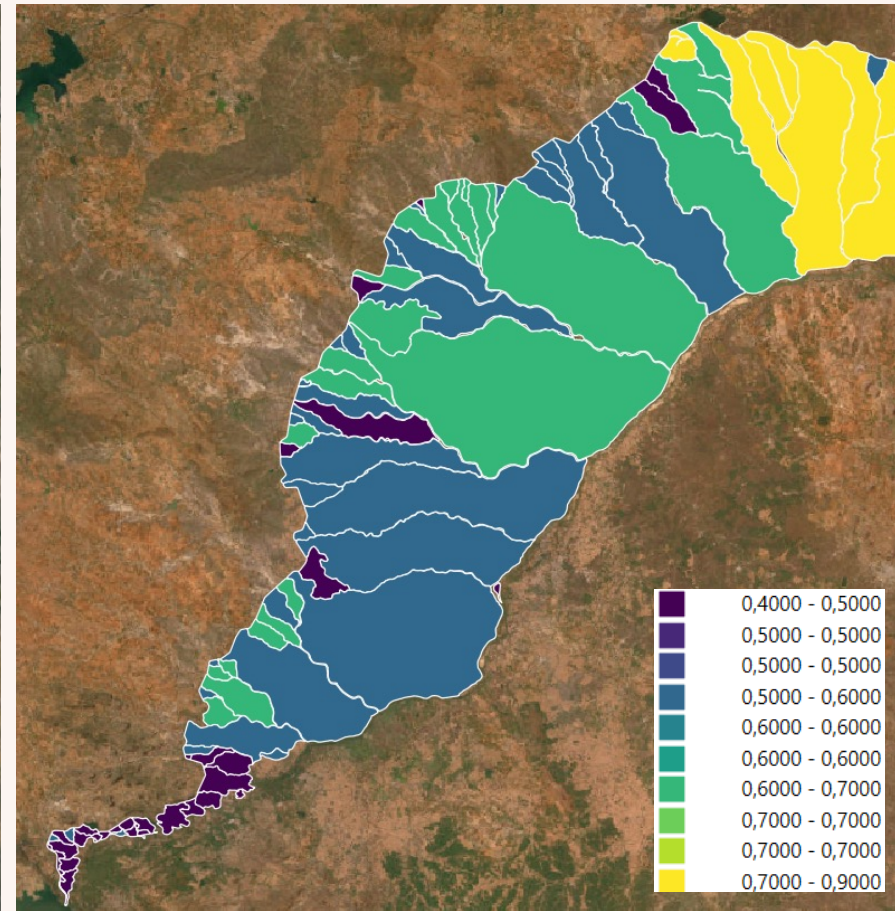
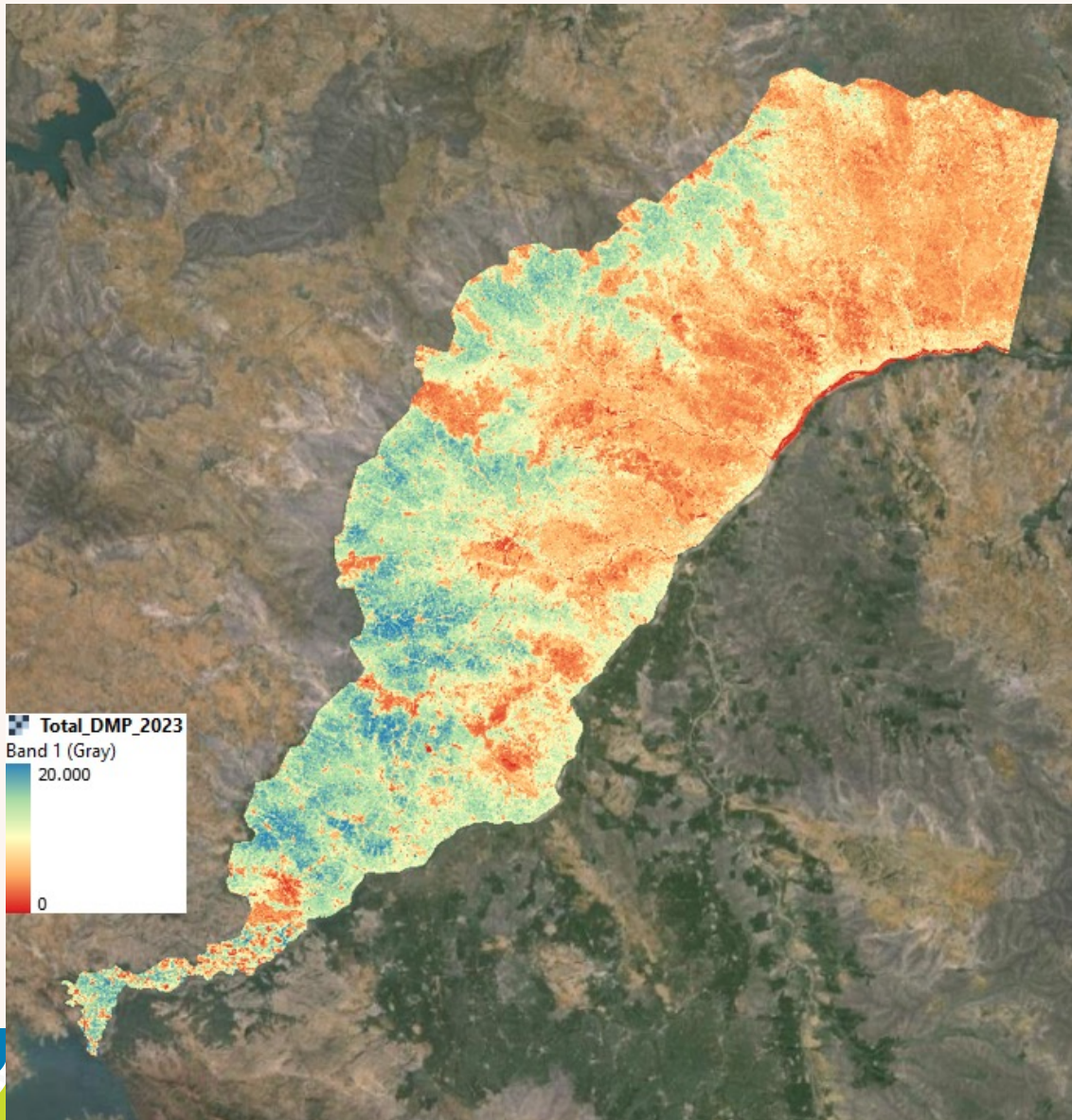
Resilience to heat and water shortage during NL drought



Areas with shallow groundwater tables (< 1m), deep rooting vegetation (forests) and non-sandy soils are much more resilient to droughts

Fig. 2. The Dutch land use data base aggregated

Rice production response to water shortage - Karnataka



Satellite measurements can be used to quantify crop yield and Water Productivity

Certain crops become more efficient with water if they are stressed



Concluding remarks

- Food security is threatened by a genuine lack of water resources
- Global warming is exacerbating this situation with more heat stress
- Use daily thermal satellite measurements for quantifying these processes
- Detect agro-ecosystems that are more resilient (Netherlands)
- Detect cropping systems that becoming more efficient under water stress (India)
- Develop a system that benchmarks crop water productivity



Thank you!

ADB Food Security Forum
info@foodsecurityforum.adb.org

