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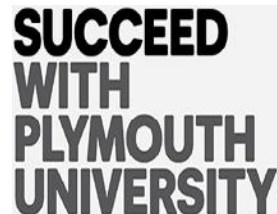
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**NEW OPPORTUNITIES IN A FAST CHANGING &  
DEVELOPING AGRITECH SECTOR:  
FROM TECHNOLOGY, DATA, RESOURCE MANAGEMENT,  
NOVEL CROPS TO ANIMAL AND PLANT HEALTH**

# Agri-tech sector challenges & Opportunities

Dr Khalid Mahmood



# Global Challenges for Food Security

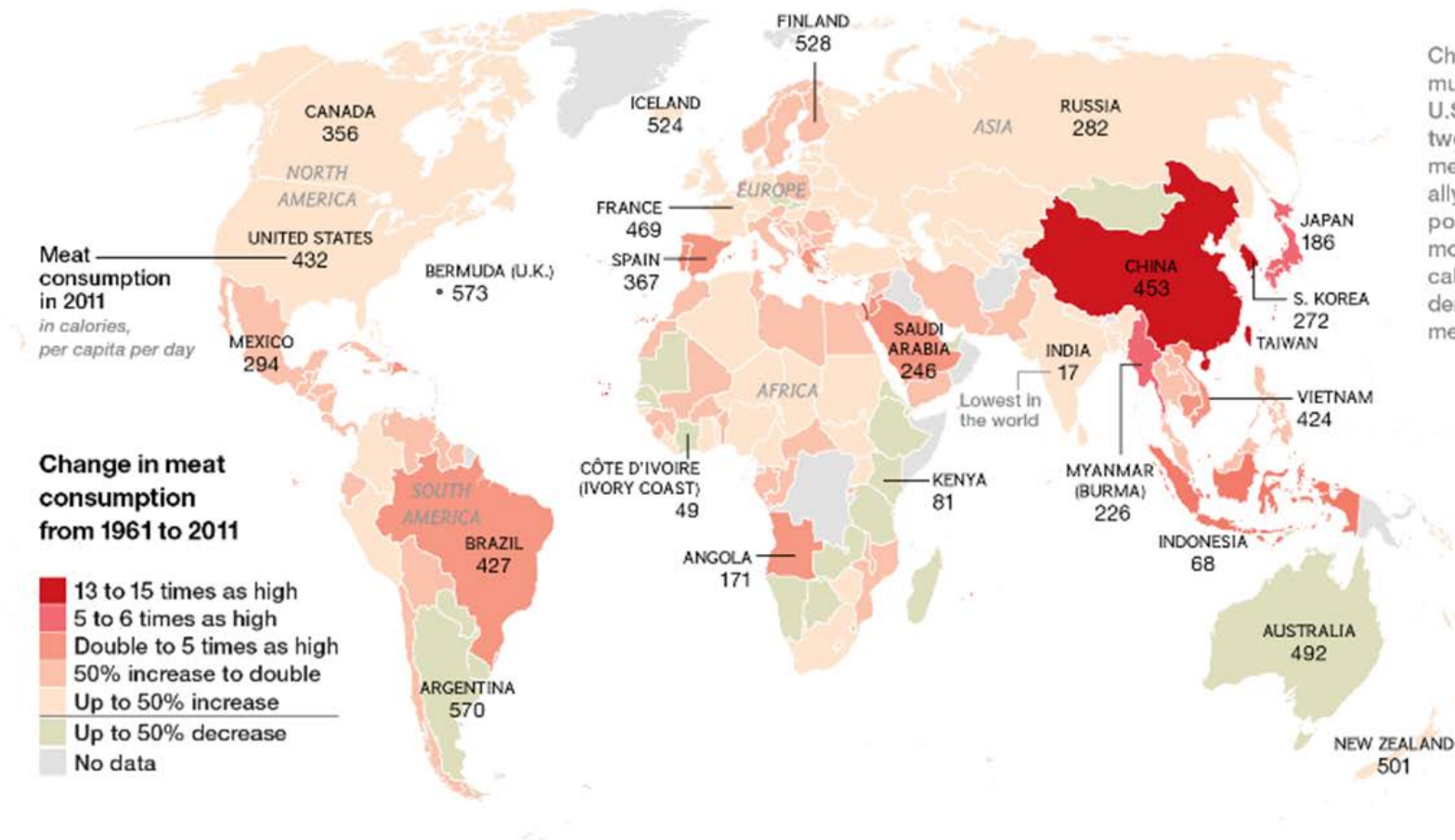
- Increasing population -9b 2050
- Increasing urbanisation
- Climate change
- Demand for animal protein
- Pressure on resources

e.g. water, phosphates, pests resistance.

# Increasing Demand for Meat

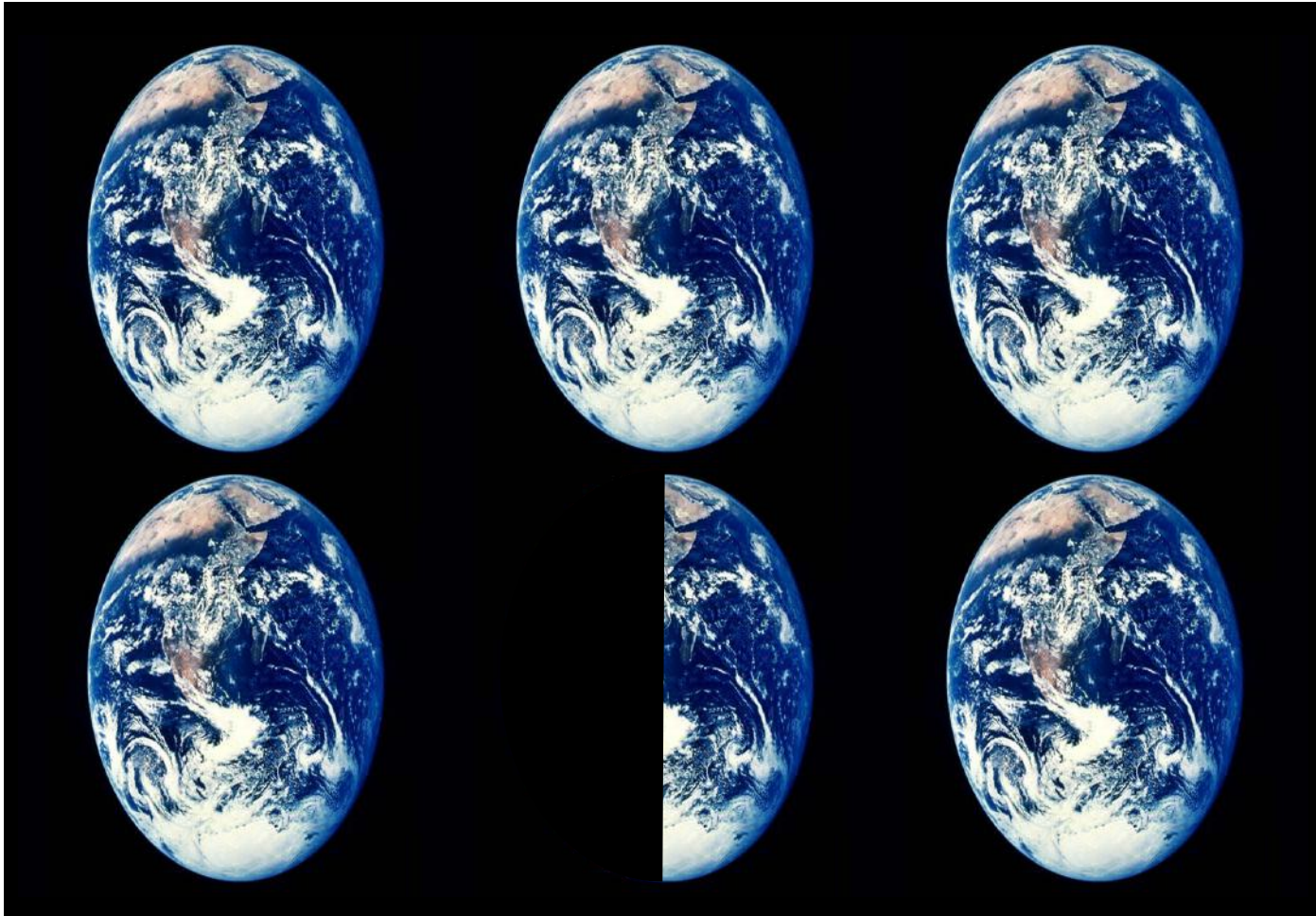


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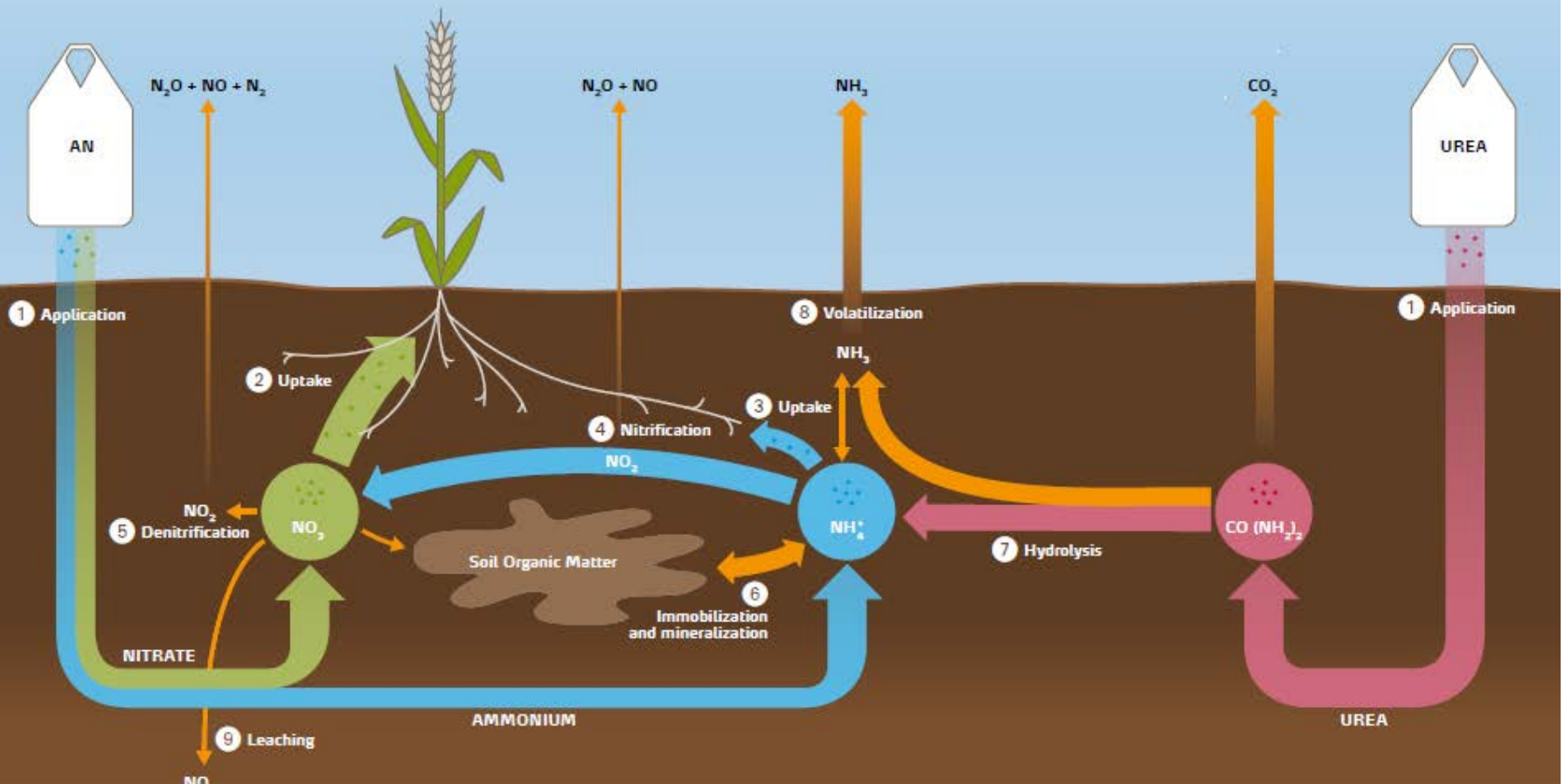
China eats half as much meat as the U.S., but because two-thirds of its meat has traditionally been high-calorie pork, it consumes more total meat calories. Now demand for lean meat is rising.

# Extra Planets?

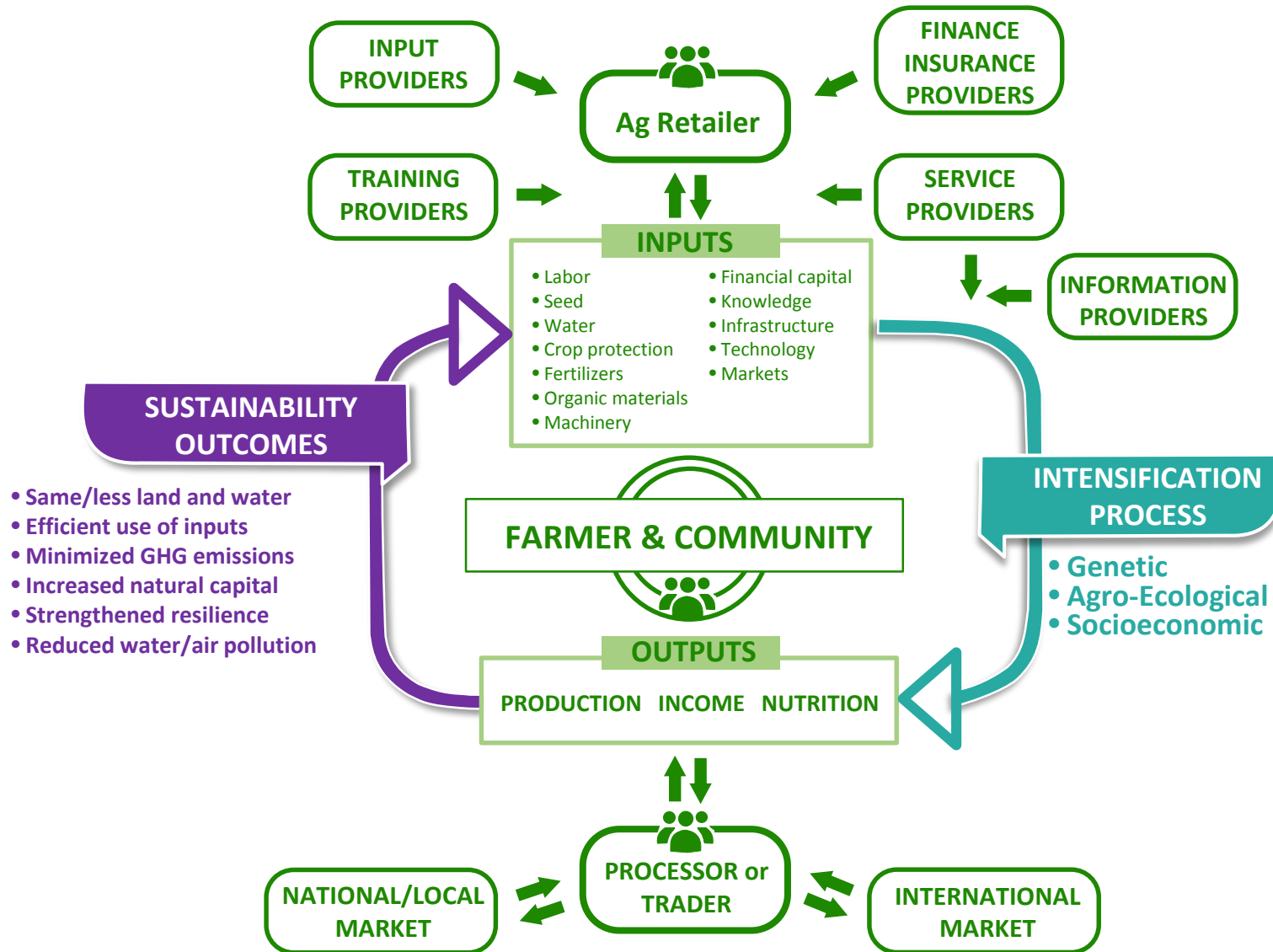


# GHG Emissions

CH<sub>4</sub>, Methane, Ammonia, NO<sub>2</sub>,



# Sustainable Agricultural Intensification



# Soil to Nutrition

## Cycle of mechanistic understanding and application e.g. N ENU

SOIL-PLANT  
MECHANISMS



LANDSCAPE  
MECHANISMS

Soil processes  
governing N uptake



Optimising landscape  
productivity,  
reducing N losses  
and building  
resilience



Farm interventions  
for N ENU



Soil-plant-biota  
mechanistic  
understanding

New generation  
mechanistic soil  
models

Novel  
indicators

Fit-for-purpose  
sustainability  
metrics

Adaptive  
systems

SI  
'hub'



# Nutrition



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- **Foods to improve the health of the nation**
  - Lipids (P:S; omega-3:omega-6)
  - Protein (amino acid balance)
  - Micro-nutrients (Minerals and vitamins)
  - Social science – what we eat
  - Malnutrition vs. Obesity



- **Solutions**
  - Eat less of a higher quality
  - Importance of high quality livestock products in the diets of the poor



# Managing landscapes for ecosystem services



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## OUTCOMES

Quantifying the contribution of non-crop biodiversity to the delivery of ecosystem services (and dis-services).



## CHALLENGE

Making explicit the link between habitat management, functional biodiversity and crop production.



## VALUE

Targeted design and implementation of management at a farm / landscape scale that minimises crop losses and supports production

# Push Pull System-Africa

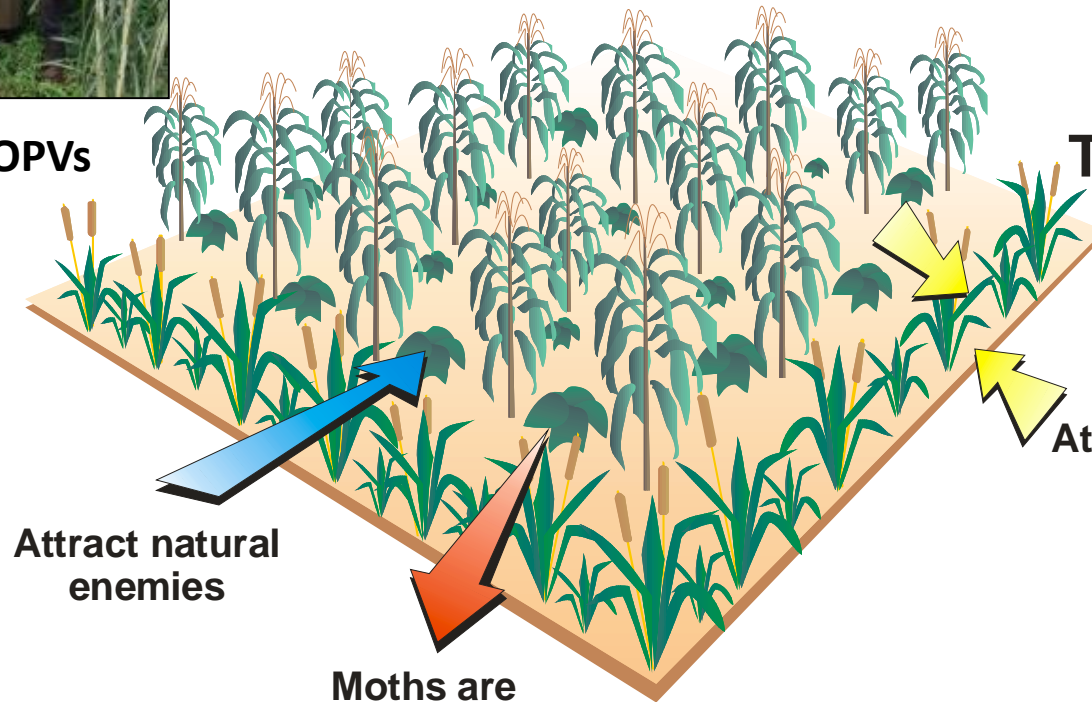


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Maize OPVs

Main Crop



Trap Crop



*Brachiaria* spp.

Attract natural  
enemies

Attract moths

Moths are  
pushed away



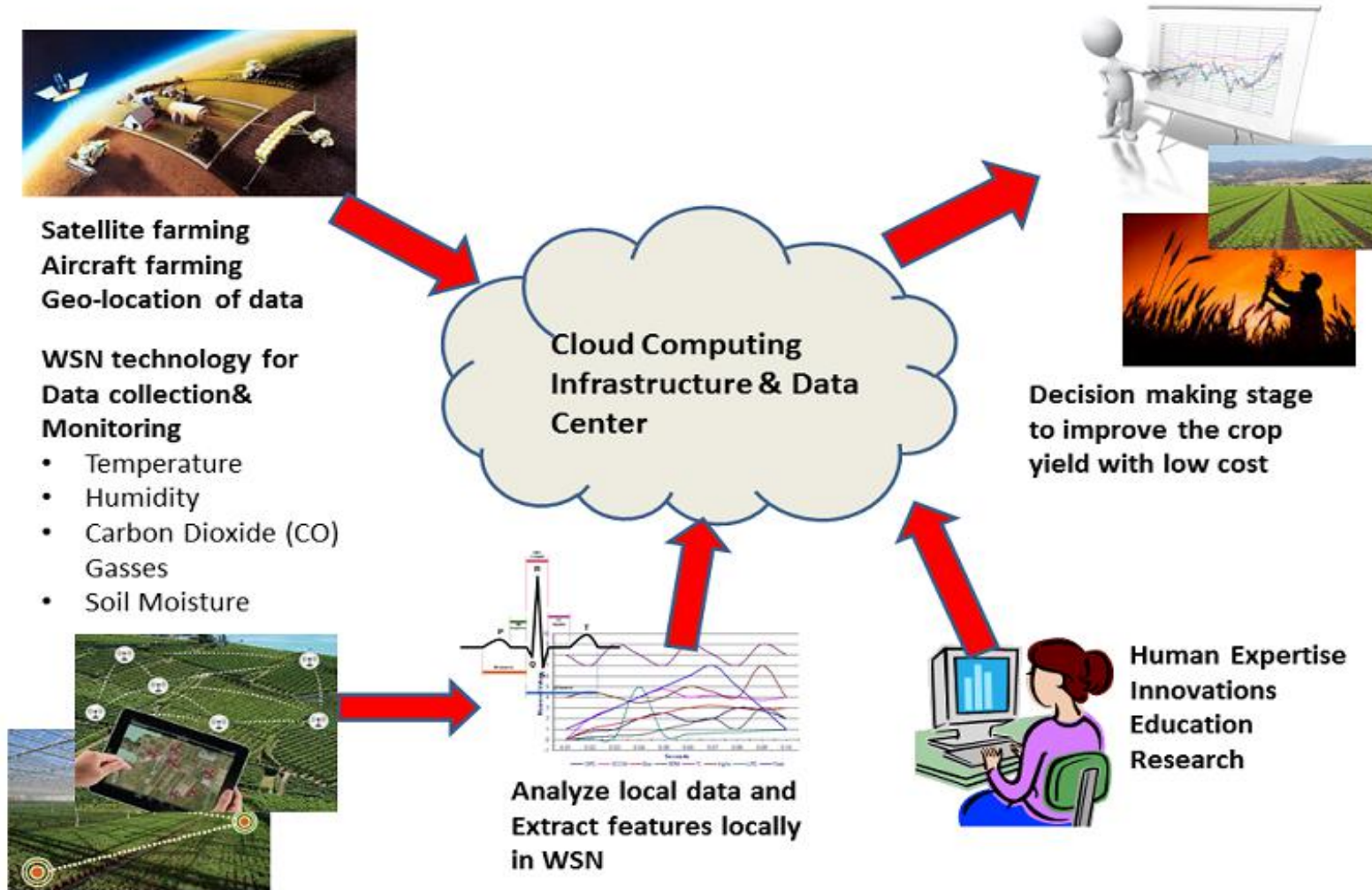
*Desmodium* spp.



# IOT Agriculture



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**THANK YOU &  
KEEP IN TOUCH**