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How agriculture industry and small farmers benefit from data technology: the challenges and opportunities

7 Sept 2016 – Trevor Crook

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In the real world agriculture faces many challenges

People and community

- Aging farmer base and increasing scarcity of labour
- Gen Y and Zs are not interested in farming (but they are early adopters of technology)
- Growing world population is increasing demand for food, fuel and fibre products
- Decreasing community acceptance of farm activities impacting on nearby urban lifestyles

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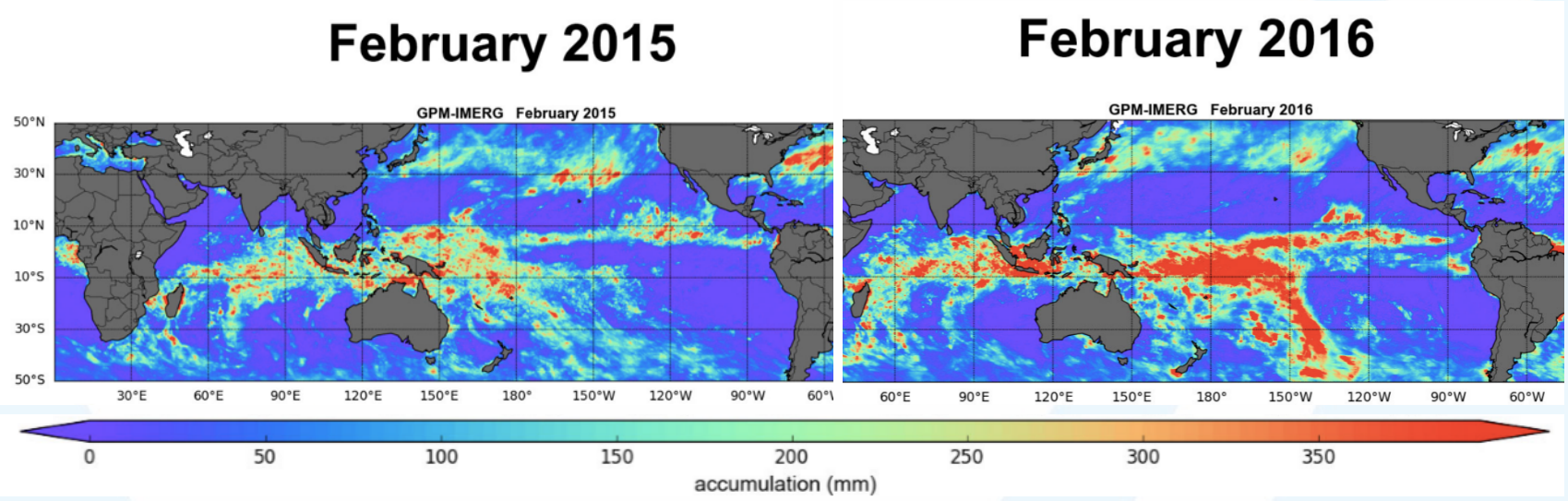
In the real world agriculture faces many challenges

Environment

- Climate change will cause increased variability in rainfall intensity, duration and frequency
- Pressure on Agriculture to reduce environmental impacts
  - Carbon emissions and water quality



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In the real world agriculture faces many challenges

Profits

- Increasing costs of production …..
- Faster than advances in yields and expansion of area
- Limited resources of land and water from which to grow and expand

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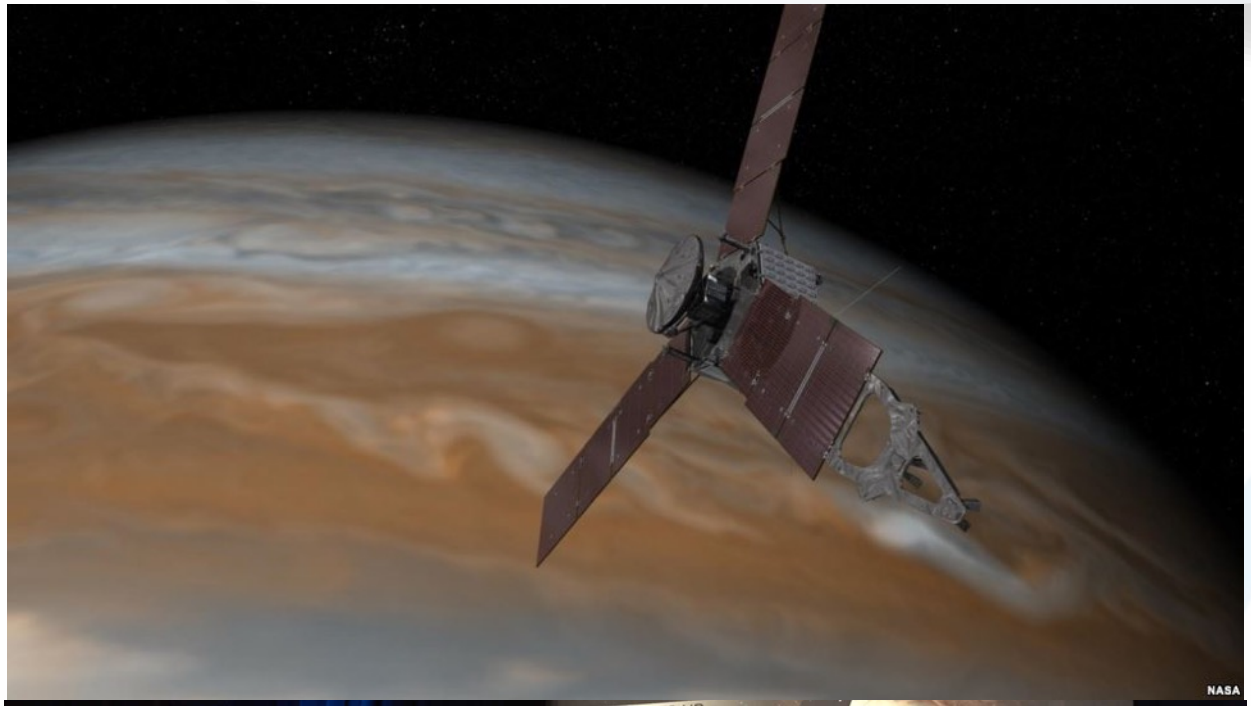
In the digital world everything is possible



NASA officials and members of the Juno mission team celebrate the spacecraft's successful arrival at Jupiter on July 4, 2016.

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The rate of adoption of new technology in Agriculture is often quite slow

- Developing technology is expensive, time consuming and risky
- Very often the farmer is left alone to implement

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Data technology does not replace science and practice

Solutions need to be developed and implemented by people with a mix of skills and knowledge:

- The people who are good with data and technology lack the practical farm experience and basic agronomic principles in order to develop solutions
- The people who have practical farm management experience and sound knowledge of agronomic principles often lack the ability to apply data and technology to address agronomic challenges

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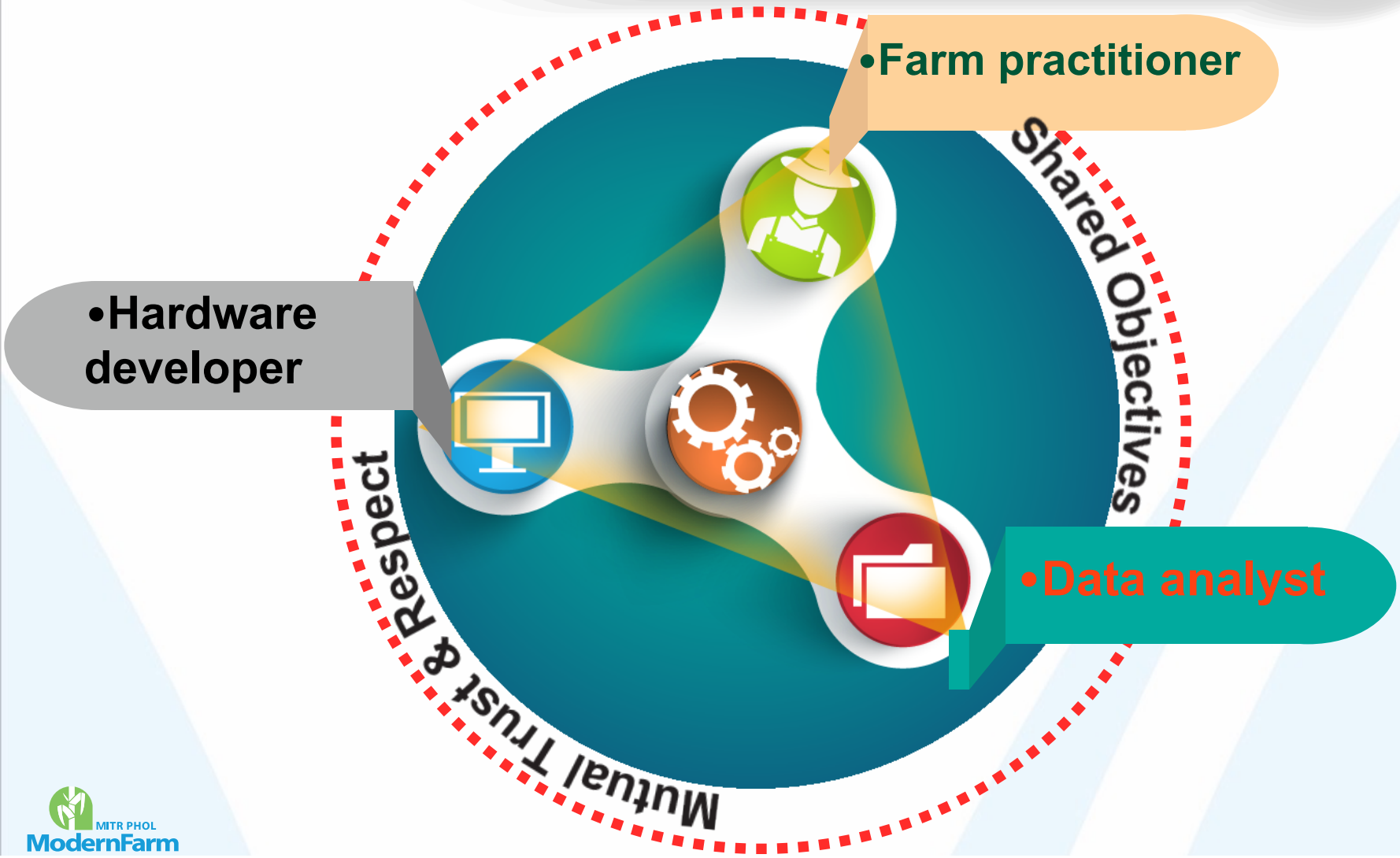
Most sustained success results from effective partnerships



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What is Mitr Phol doing in this area?

1. Systemising operation - Modern Farm
2. Developing the skills and knowledge of farm practitioners and agronomists
3. Investing in development of data technology solutions
    - Next I will show you some examples

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1. Field design, drainage and GPS guidance is the basic foundation

- Requires land, soil and elevation data available in a GIS system
- Without this foundation further progress will be limited

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2. Environmental monitoring

- **Objective**
  - reduction in nutrients and pesticides entering adjacent waterways

- **Progress**
  - Water quality monitoring


Water quality monitoring

- **Next step –**
  - Understanding what the data means and how each farm practice impacts on water quality


Lysimeter measuring nutrient loss

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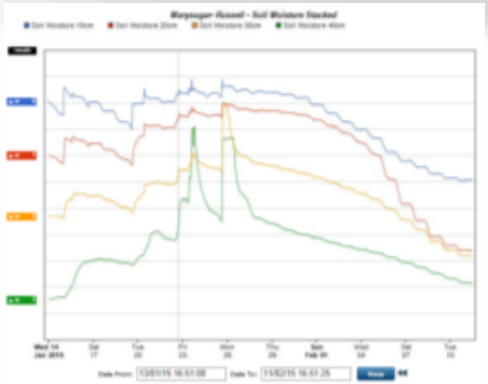
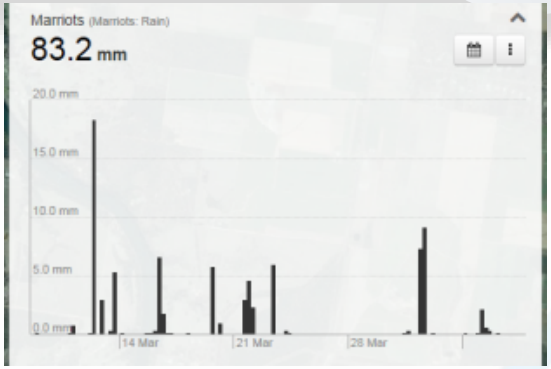
3. Knowing the crop demands for irrigation

Modelling to predict crop demands

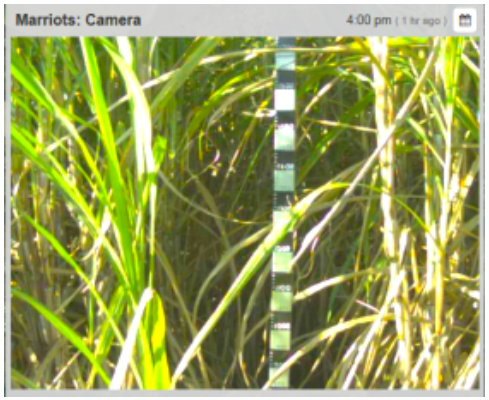


Moisture probes – Monitor soil moisture



Automatic rain gauges – Data sent by telemetry

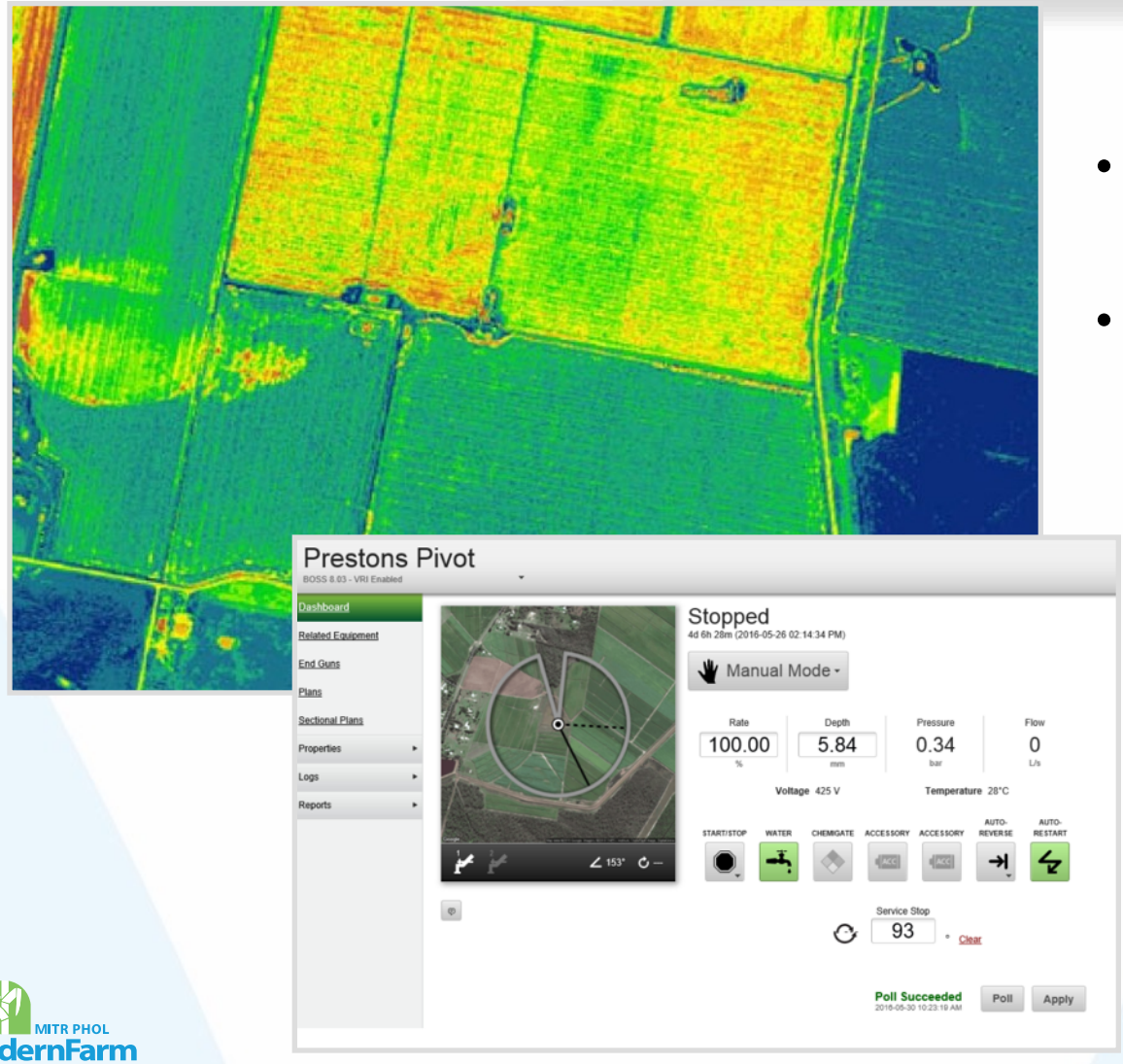
Solar powered probes send data by telemetry



Remote monitoring of crop growth

Understanding our soils.
A bit of low tech as well – measuring infiltration rates

4. Tools for improving irrigation management



- Remote pivot start up and monitoring.
- Use of satellite imagery for crop water use and Normalised Difference Vegetation Index (NDVI)

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Subsurface Drip – The Future in Irrigation

- Potential for the highest yields and low costs with low environmental impact
- Requires a high standard of farm design and management
  - Precision placement, planting, and operations
  - Disciplined maintenance and real-time monitoring
  - Automated control

→ Data technology solutions

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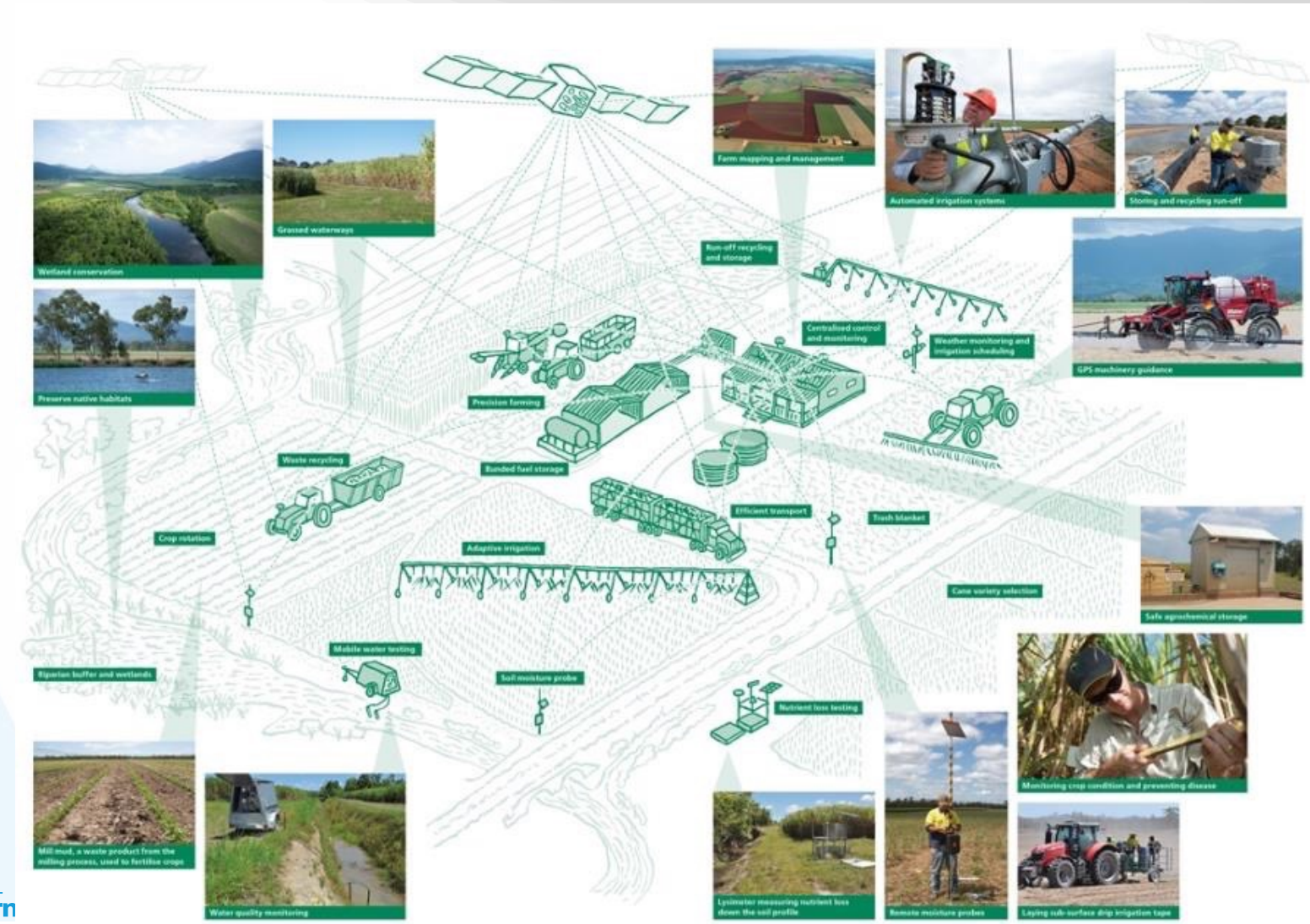
Bringing all the tools into one integrated system management



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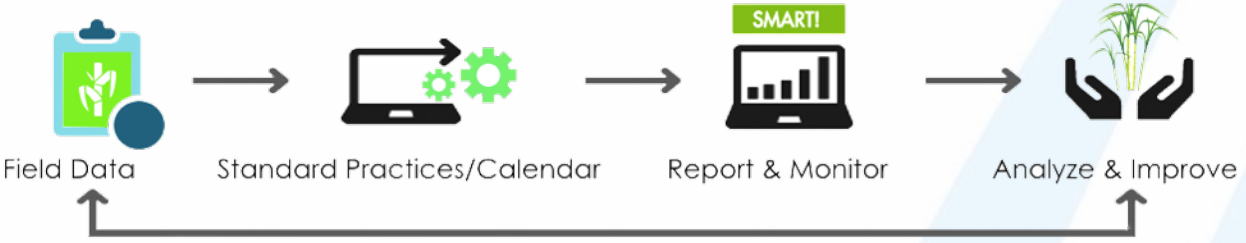
Mitr Phol FarmPro application - supporting farm decision making, quality, and cost control



♦ Mobility ♦ Standardisation ♦ Centralisation ♦ Communication

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Also supports record keeping for traceability and compliance auditing

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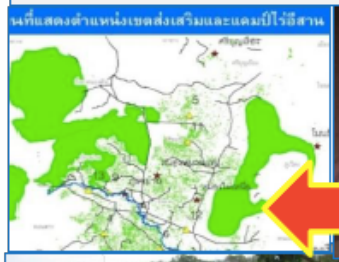
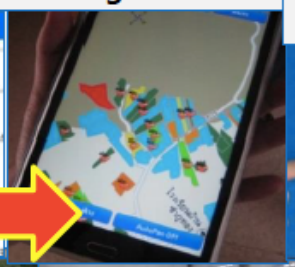
Conversion of natural vegetation	Environmental impacts
Labour standard	Chemical safety storage	Labour policy and Worker benefits





Nestlé
Good Food, Good Life

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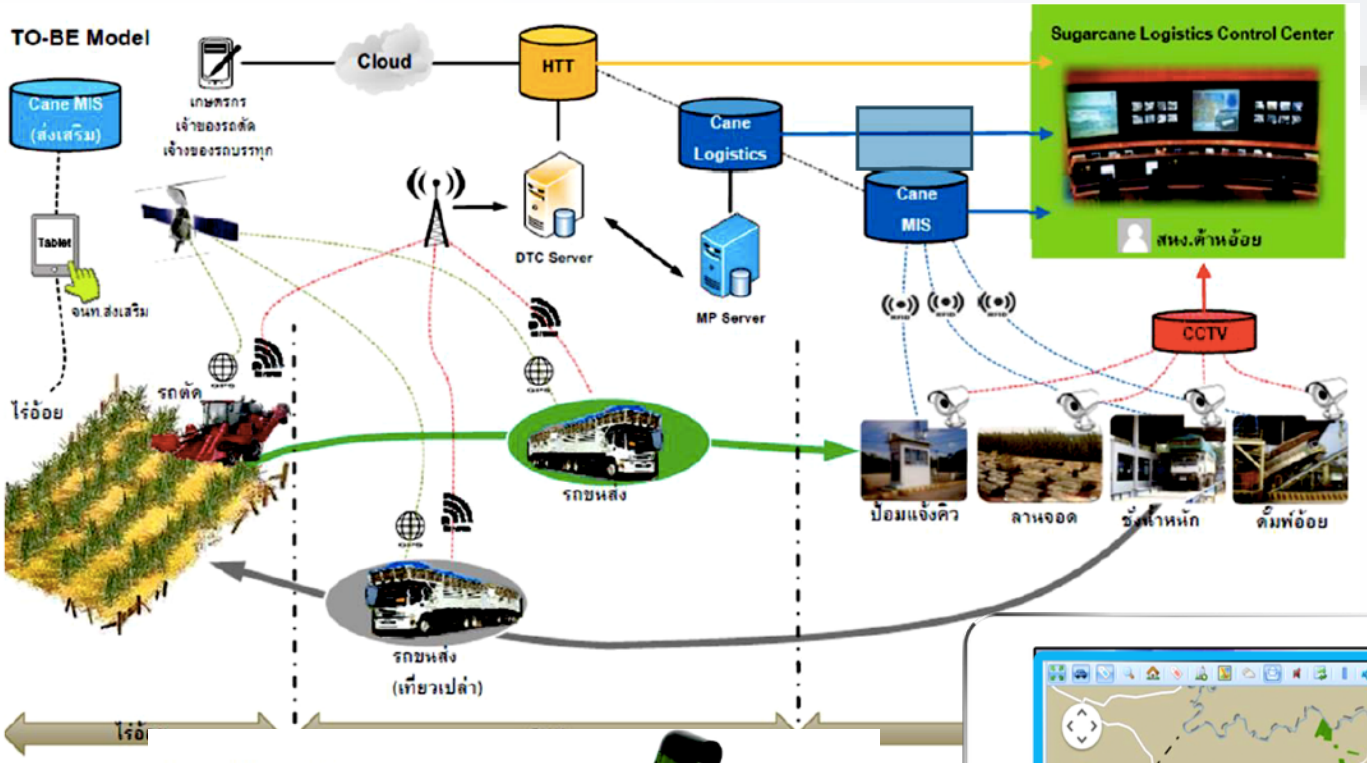
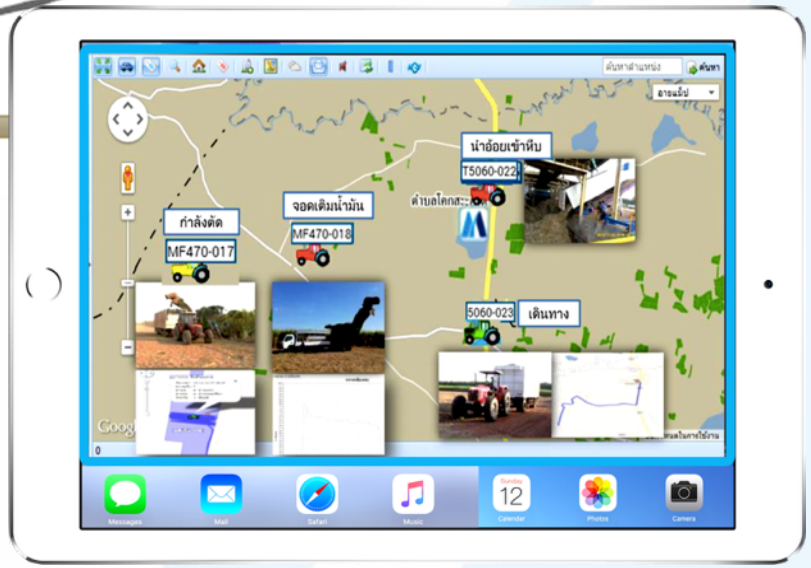
And logistics management





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The application of data technology in agriculture will attract new generation

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Conclusion

1. Data technology offers exciting opportunities to support and transform agriculture
2. Solution development requires advanced understanding of practical sciences applied to each challenge / opportunity
3. We must build a solid foundation first

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