



THE UNIVERSITY of EDINBURGH  
Global Academy of  
Agriculture and Food Systems

**IDI** Data-Driven  
Innovation  
Part of the Edinburgh & South East Scotland City Region Deal

# Data Governance Challenges in 'Data-Driven' Farming

Aditya Singh

**EDINBURGH**  
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# Content

- What is Data-Driven Agriculture
- The Promises
- The Perils
- Regulatory State of Play
- Ways Forward



# The Future of Agriculture?

## ‘Data-Driven Agriculture’ ‘Smart Farming’

- Traditional Equipment like Tractors, now with Sensors
- Newer types of technology and data collection: Satellite Imagery, Drones
- Granular, real time insight – soil, water, nutrients, weather, crops (etc)

Image: [Midjourney](#)



# The Datafication of Everything

- ‘Data is the New Oil’
  - More Data! More ‘Artificial Intelligence’!
- ‘Precision Agriculture → Data Driven Agriculture’
  - ‘Big’ Data : Volume, Variety, Velocity



TC TechCrunch

### Monsanto Buys Weather Big Data Company Climate Corporation For Around \$1.1B

Today's big acquisition is a huge agritech exit: Biotech company Monsanto has bought Climate Corporation for approximately \$1.1 billion.

2 Oct 2013



F Fortune

### John Deere Is Paying \$305 Million for This Silicon Valley Company

John Deere's is acquiring Blue River Technology for its machine learning-powered crop sprayers.

6 Sept 2017



Image: [Midjourney](#)



# The Promise

**F** Forbes

## The Amazing Ways John Deere Uses AI And Machine Vision To Help Feed 10 Billion People

Agricultural businesses are faced with the challenge of feeding a growing world population while reducing the environmental impact and...

15 Mar 2019



## Support Decision Making

- On-Farm : Crop Recommendations, Nutrient Recommendations, 'Sustainable Intensification'
- Off-Farm : Environmental Impact Monitoring; Research and Innovation

## Governance

- Transparency and Traceability; Food Quality and Environmental Regulations

## Automation related efficiencies



# The Peril

- Who controls the data?
- Asymmetries in Power
  - Price Discrimination?
    - Insurance Products, Farming Inputs
  - Market Speculation?
- Data for 'Good'
- The Challenge : Limit Harm, Increase Benefit

Image: [Midjourney](#)



# The State of Play - Data Licenses

- Terms and Conditions that come along with Equipment; But
  - people do not read them; or
  - do not understand them; or
  - lack knowledge to make an informed decision; or
  - are not offered choices that accurately reflect their preferences.
- Harms from data are hard to estimate – and can develop over time
- Farmers have no alternative

A survey from Australia on terms of conditions around data, when signing up to a service :

- 47% of primary producers said they had ‘no understanding’;
- 27% said they had ‘little understanding’. (Wiseman and Sanderson 2018).

Another study (in Australia):

- 74% of the respondents claimed to not know much about the terms regarding data use and collection in agreements they had entered into; 9% indicated that they had a good understanding of the terms and conditions. (Wiseman et al, 2019).



# The State of Play – Codes of Conduct



EU Code of conduct on agricultural data sharing by contractual agreement



American Farm Bureau Federation's Privacy and Security Principles for Farm Data



Australian Farm Data Code

+ Model Clauses

+ Best Practices

+ Guiding Principles

- Voluntary

- Nothing about 'Positive' Use





# Conclusion: Ways Forward and Questions

- Closer regulation and scrutiny over permitted uses
  - Price Discrimination
  - Market Trading
  - What else?
- Data Access Regimes – The EU’s ‘Data Act’?
  - User and Third Party Right to Access Real Time Data
- Is this the future of farming?
  - Big Data <--> ‘Big’ Farming





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# Thank you

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