



Does collaborative farm-scale modelling address current challenges and future opportunities?

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Opportunities for farm-scale models

- Developments in sensors and IT, Internet of Things
 - Enables local parameterisation
- Mitigation of GHG emissions
 - EU effort-sharing decision on non-ETS emission reductions
- Adaptation to climate change

Challenges for farm-scale models

- Scientific
 - How to model new farming technologies (e.g. NH_3 stripping)
 - Simulation of effects of weather extremes
- Widen the user base
 - Accessibility
 - Reliability
- Resources for agricultural research
 - Have generally been reducing
 - Increasingly short-term

Widening the user base

- Usability – user interface
 - Configuration and input
 - Output and overview of results
 - Help
- Reliability
 - Scientific and technical documentation
 - QA/QC – including version control
 - Parameterisation – extent and limits
 - Long-term accessibility – legal constraints
 - Long-term development – scientific, technical

The problem

- Resources required increasing, resources available decreasing
- Single-owner models
 - Model is owned by an individual or single organisation
 - Traditional approach
- Community models
 - Model is owned by a group of individuals or organisations
 - Possible due to increased mobility, collaboration, www

Single-owner models

■ Advantages

- Benefit from earlier investment
- May have access to cheap labour or a generous benefactor
- Commercialisation may be an option
- Streamlined management
- Low communication overheads

■ Disadvantages

- Vulnerable to fluctuations in funding
- Vulnerable to staff changes (e.g. retirement)

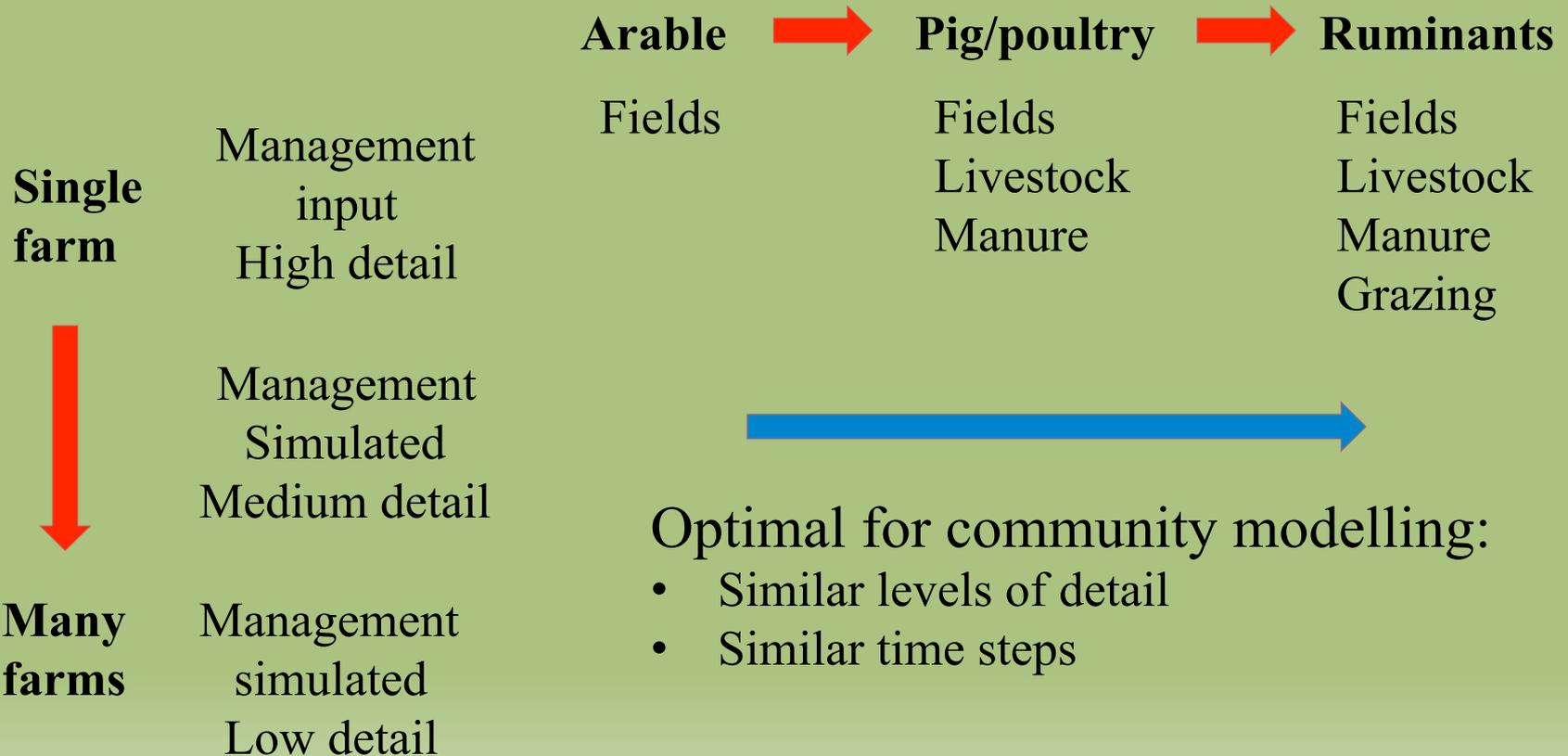
Community modelling - advantages

- Shared costs
 - Some functions are common for all farm models
 - Technical development
 - Scientific improvements
- Achieve more with less
 - Including access to empirical data for parameterisation & testing
- Intellectual forum, mutual support
- Greater credibility – QA/QC
- Greater resilience to fluctuations in funding, staffing

Community modelling - disadvantages

- Need agreed procedures for
 - Sharing costs
 - Maintaining standards
- Organisational barriers
 - Wish to retain ‘flagship’ models, ‘not invented here’
 - Resistance to sharing costs
- Technical issues
 - e.g. Windows v Linux
 - Migration of existing software modules
- Scientific limitations
 - Some underlying concepts may be inflexible

Who should be talking to whom?



Revolution or evolution?

- Creating a new model system?
 - Compare model simulations using standard scenarios
 - Discuss processes and level of detail
 - Get to know each other
 - Discuss IT, management and cost sharing
- Joining an existing model system?
 - These decisions will have been made
- Competing modelling systems?
 - Probably inevitable (Windows v Linux, programming language)
 - Dialogue between them would be useful

Conclusions

- Resources required increasing, resources available decreasing
 - Farm-scale modellers will need to make strategic decisions
- Single-owner models
 - May continue with additional resources
 - Risk of ‘succession’ problem
- Community modelling is an alternative
 - Need to continue building a community of farm modellers