Landscape Decision Making Approaches & Tools Stakeholder Survey

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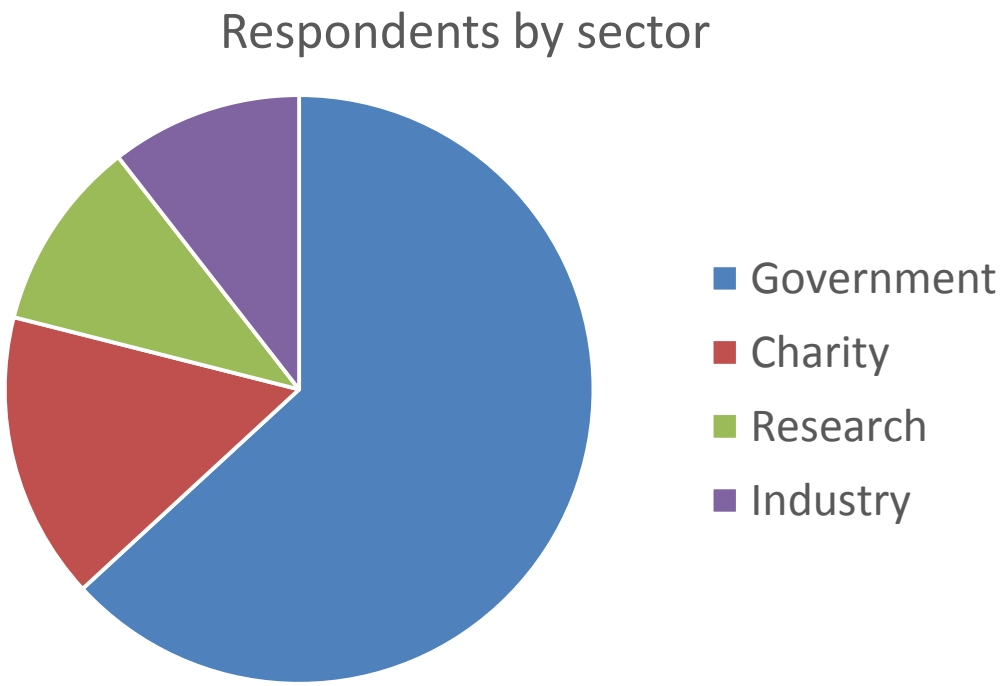
Mathematical and Statistical Challenges in Landscape Decision Making

- **Background & Objectives**

- NERC ambition to create a framework to look at landscape decisions as a whole
- This links to the cross-council Strategic Priorities Fund Landscapes Decisions Programme and various short and large maths calls have been planned
- Such a framework has to take into consideration numerous processes, interactions and high levels of complexity – which is where mathematics can help
- It's aim – to help stakeholders involved in management, planning and policy for landscape domains in the UK make better evidence based decisions
- Bringing together experts from the various research disciplines and other key stakeholders to explore relevant research and approaches for modelling uncertainty across landscapes
- Activities included research, community building, a scoping workshop, the Stakeholder Survey and the INI one month research programme in July 2019
- Stakeholder survey : (1) to develop a 'definition of the system' AND (2) to identify current modelling approaches used by key stakeholders
- Aim to understand current modelling approaches used by stakeholders and key barriers preventing them from using models to guide development of framework in programme

Summary of Respondents

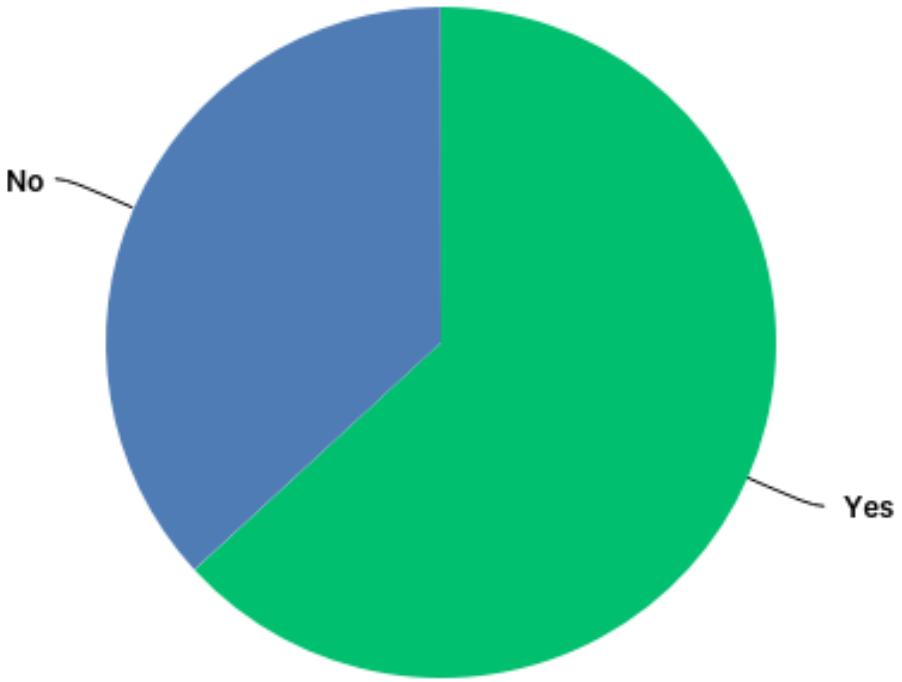
- 19 responses



Summary of Respondents Views of Landscape Systems

- Majority of respondents work in **environment/nature** at **UK scale**
- **Human health**, **recreation** and **economic security/livelihoods** the key aspects of human well being in landscape systems respondents involved in.
- **Climate change**, **economics** & **urbanisation** identified as **3 key large-scale drivers/pressures** on changes in landscape system.
- **Legal/regulatory** & **economic/financial interventions** seen as most needed response to achieve sustainability in landscape systems.
- **Biodiversity/environment**, **agriculture**, **climate mitigation/change adaptation** seen as key areas where decision support models needed

Current use of decision support tools/models by respondents



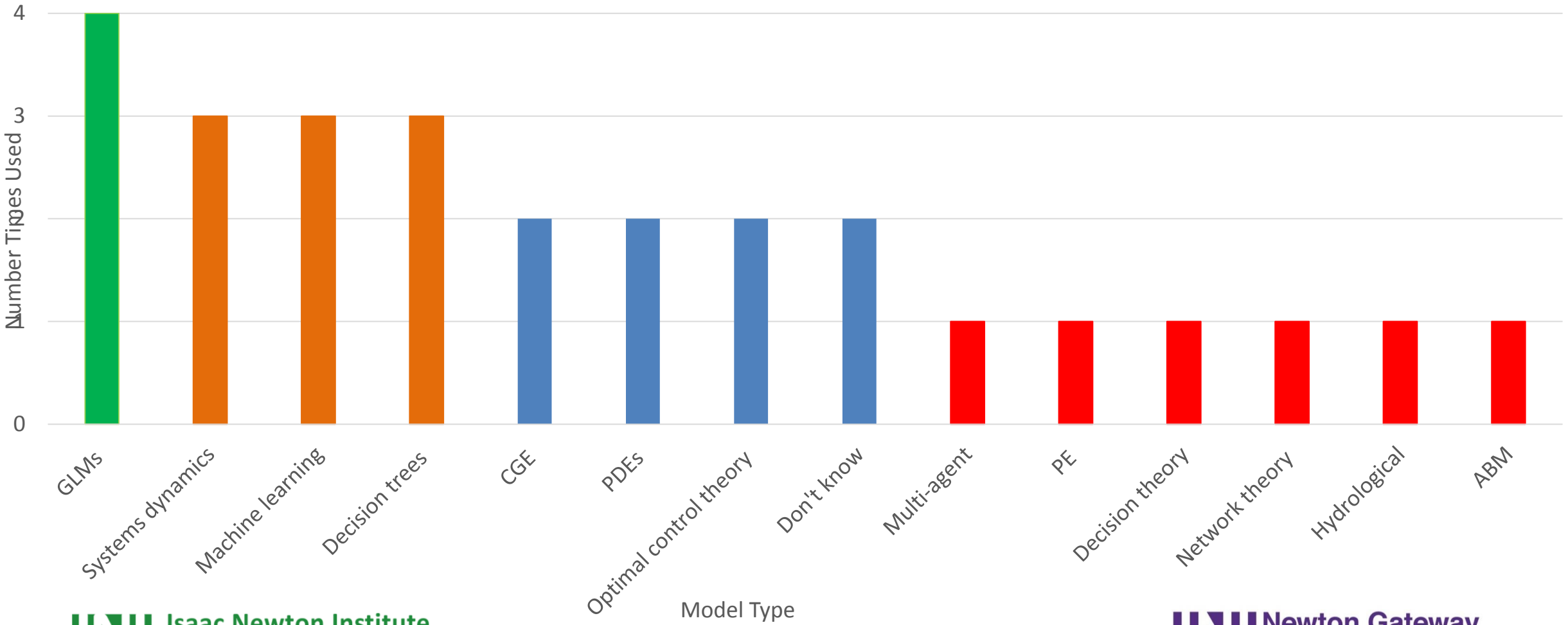
Reasons for not using tools/models

- Lack of expertise
- Don’t trust them
- Lack of capacity/resources
- Their complexity

Names of models/tools used by respondents

- InVEST (3 people)
- SWAT (2 people)
- LANDMAP
- SCANN
- The Glastir monitoring tool ERAMMP
- ECS – ecological site classification
- NEMO ERSEM
- Bespoke land use and habitat mapping tools rather than mathematical modelling

Modelling approaches used within decision support tools/models



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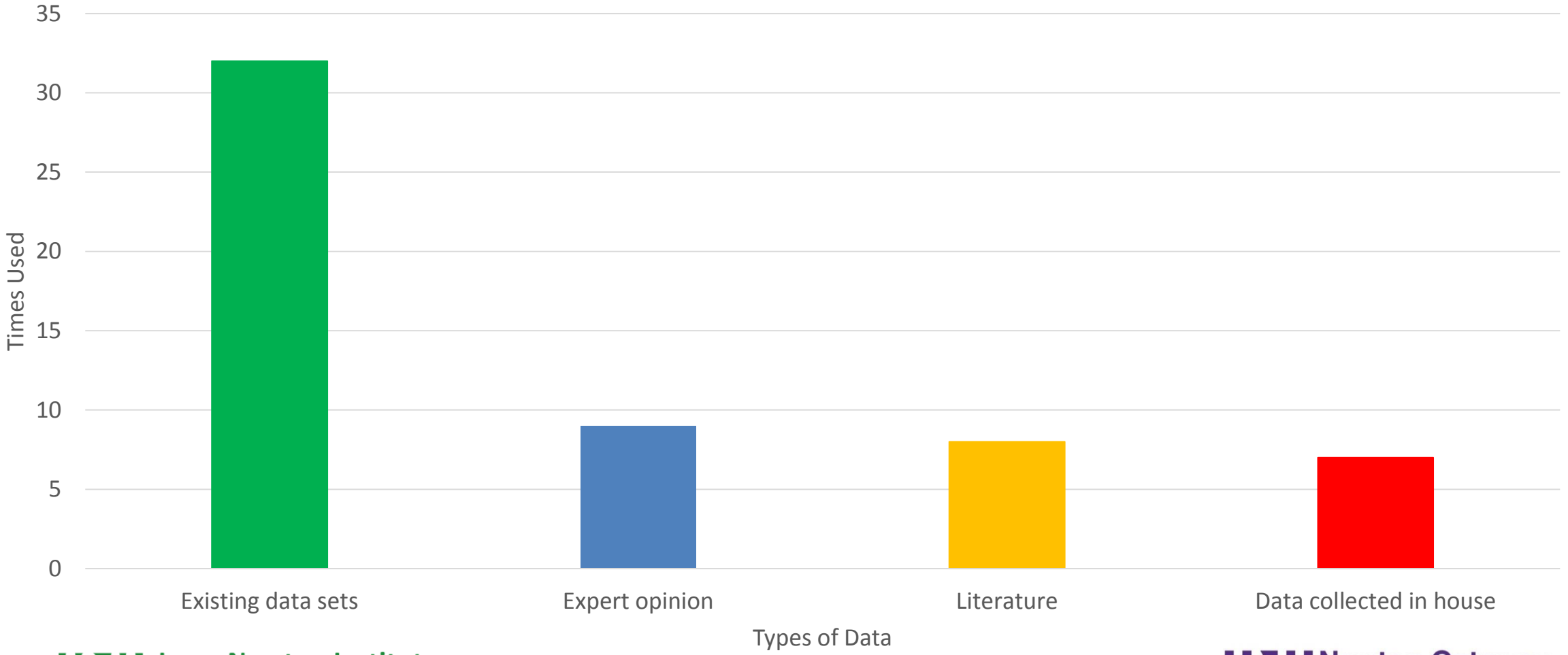
Spatial extent of decision support tools/models

- National (3 respondents)
- Multiple Countries (3 respondents)
- Regional (2 respondents)
- Multiple scales (local, regional, national) depending on the case
- All respondents used **spatially explicit** tools/models

Types of data used in decision support tools/models



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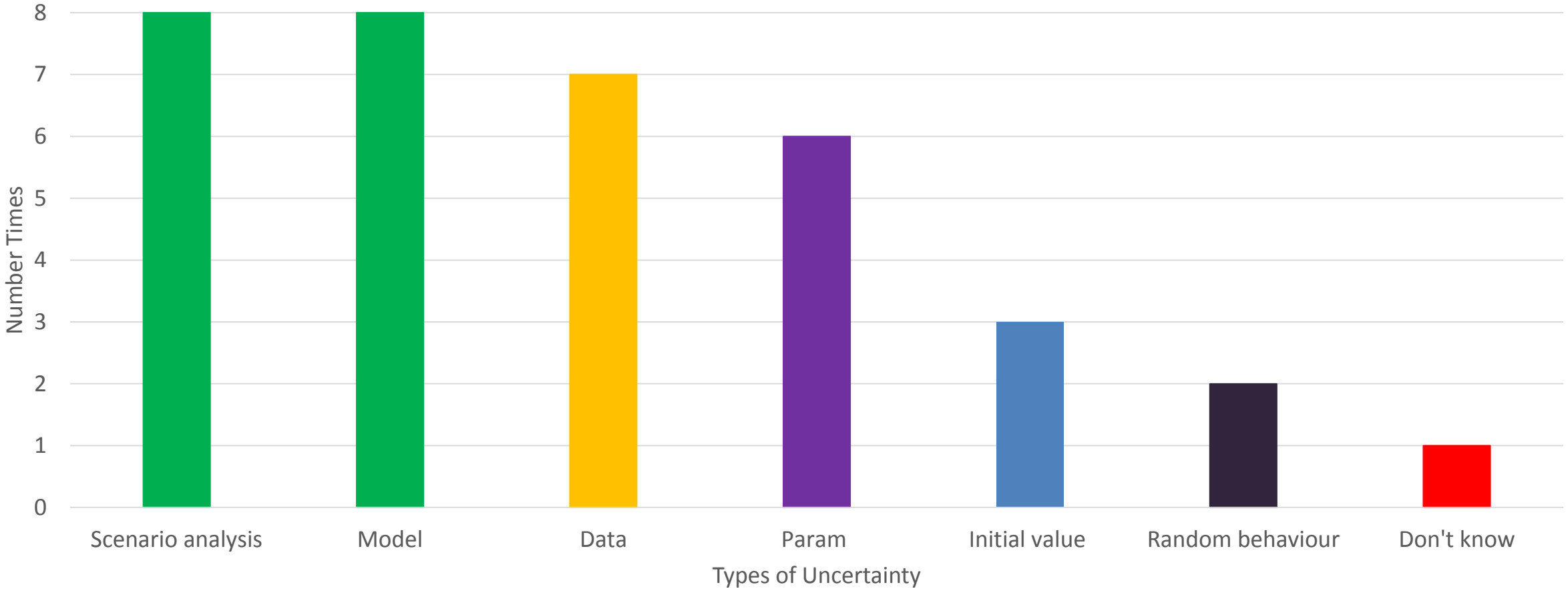
Uncertainty included in model



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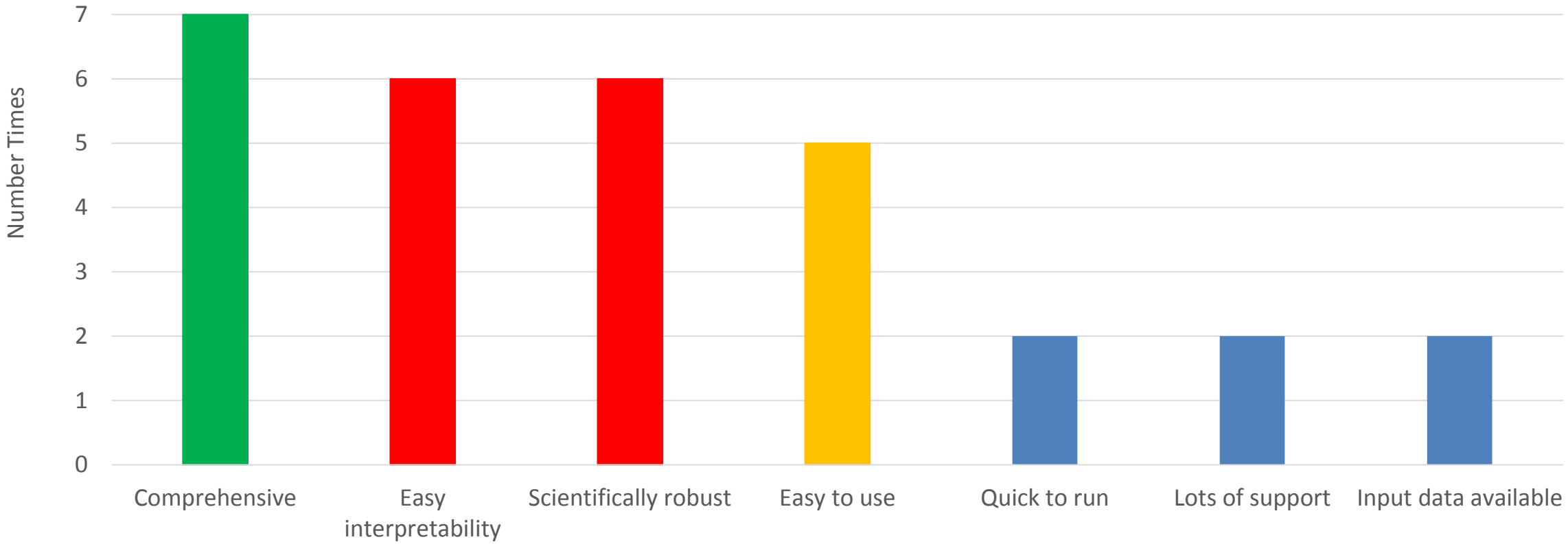
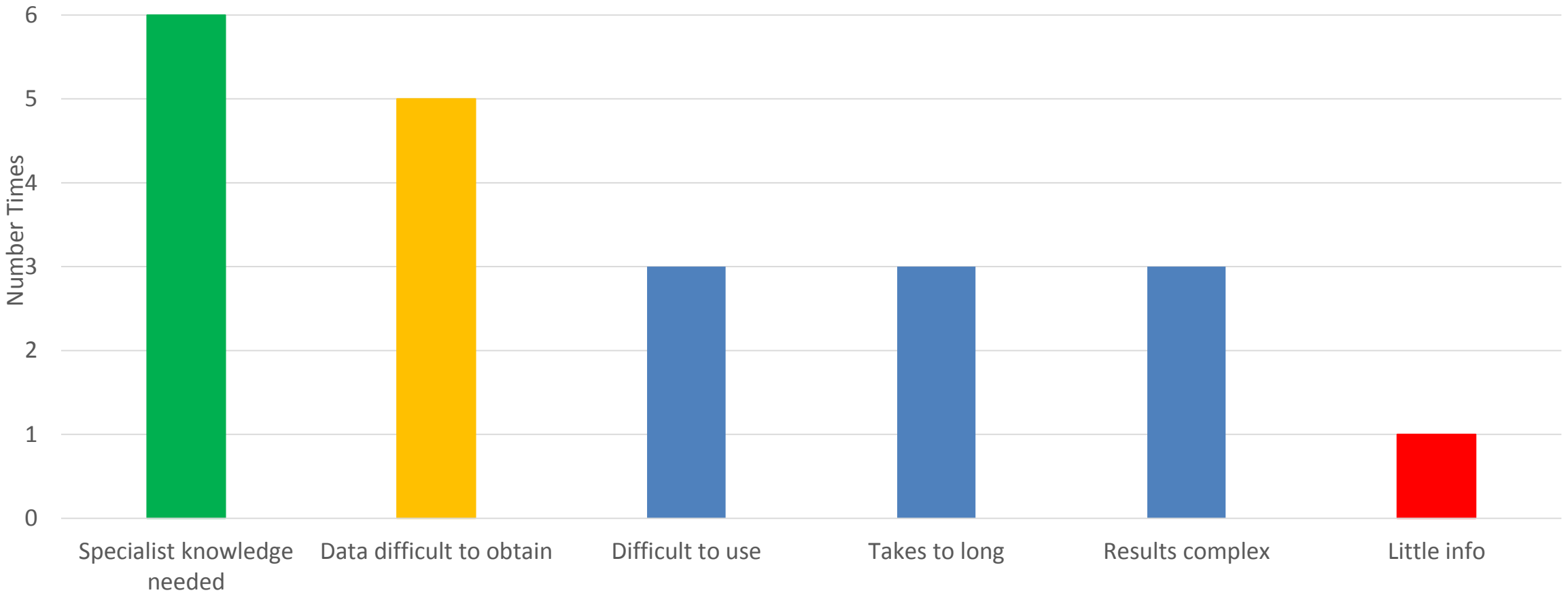
Strengths of models



Obstacles to using models



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Initial Conclusions

- Majority of stakeholders using models
- Wide range of model types
- Existing data sets most commonly used
- Most seem to know about the underlying structure of models – suggest they are not being used as a ‘black box’
- Obstacles to using models :
  - Specialist knowledge
  - Availability of data
- To ensure trust in models:
  - transparency of assumptions
  - better communication to policy makers on uncertainties/caveats

Challenges for using modelling in decision making

- *'The role of quantitative data is often used by wider society to justify and support, and possibly to help refine, their hypothesis rather than be the main driver of decision-making.'*

- *'There does not appear to be any account taken of the baseline diversity of character of landscapes (and sense of place) that are impacted by pressures. How can modelling embrace such values (alongside the more tangible ones) to inform decision making'*