Law, Science and Water Under Pressure:

Governing Data in a Water Democracy

A Crisis of Expertise? Legitimacy and the Challenge of Policymaking

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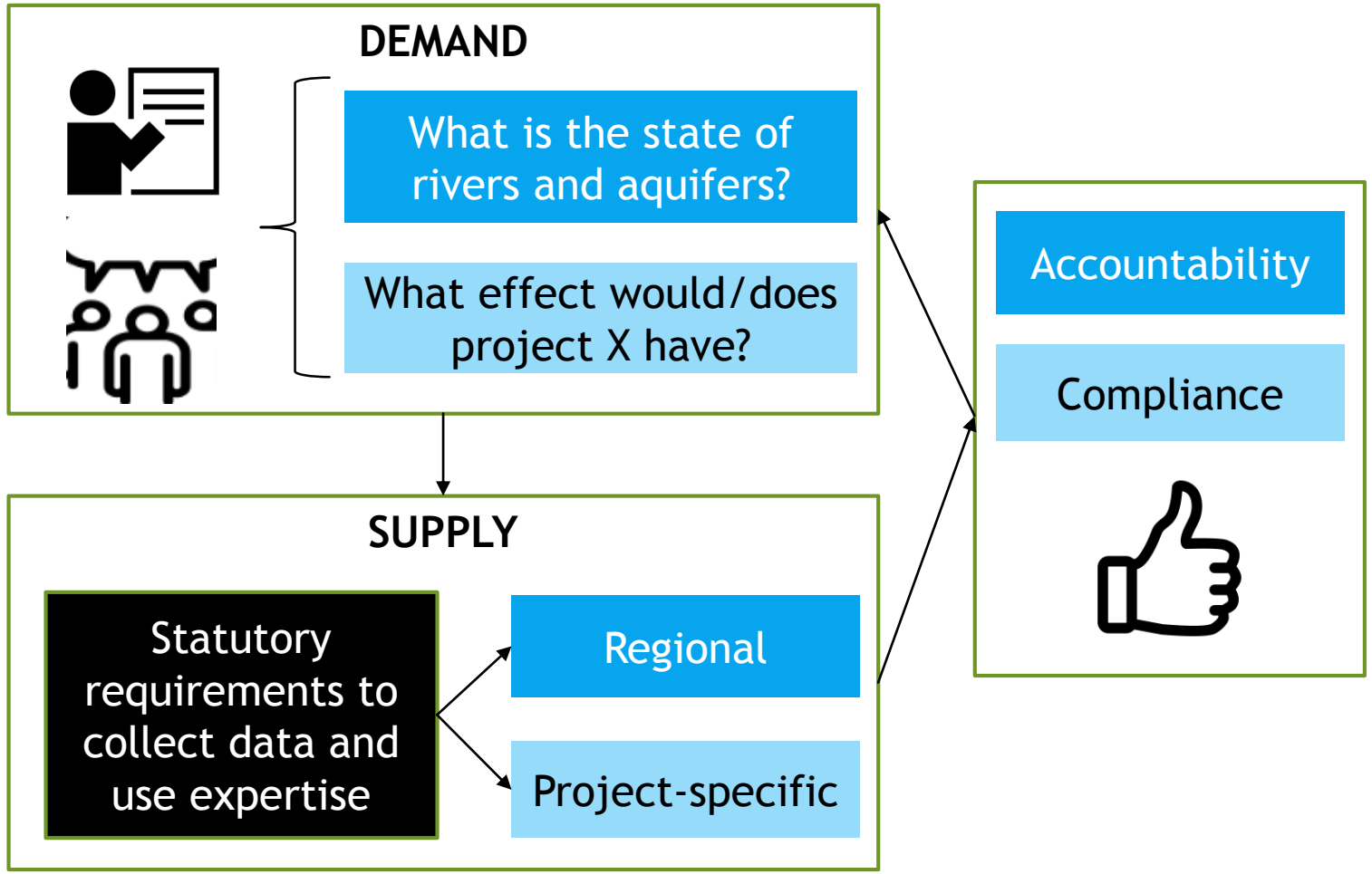
Summary

- Need data to manage a resource, data is a prerequisite for the application of expertise and meaningful public participation
- Law plays a critical role in demand and supply of data and expertise
- Framework of 3 ‘views’ to evaluate laws for water data & expertise
- Applying the framework to laws in coal/CSG context → weaknesses revealed by legal and stakeholder analyses
- Perhaps the law + technical approach of ‘multiple narrative modelling’ can assist…

Background: Water politics & policymaking in Australia

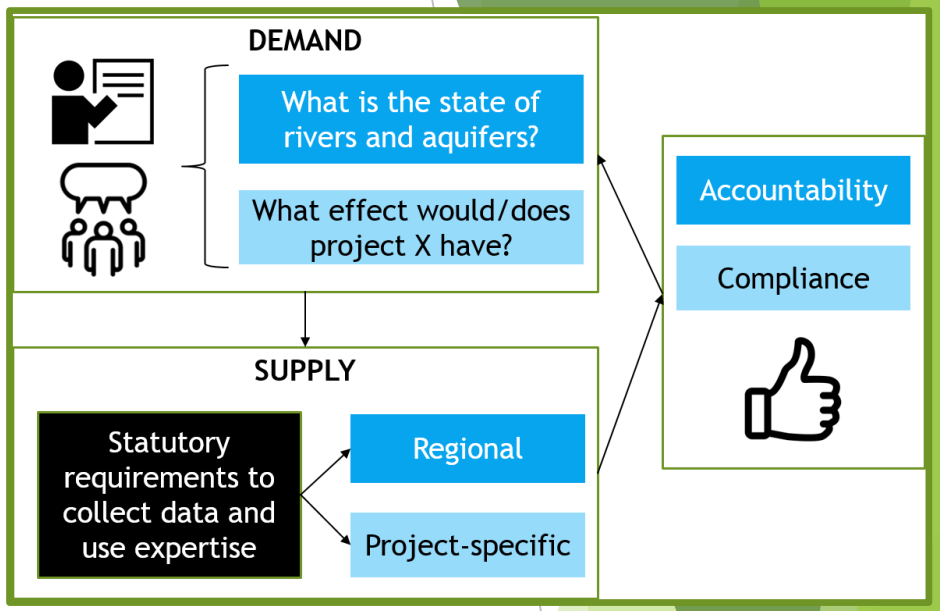
Why talk about laws about data?



- Acknowledge
  - STS work on data & experts, eg CRELE
  - Law-related work on collaboration, deliberative participation, knowledge co-production
- Law (usually a statute or regulation): demands and structures supply of data and expertise

A framework for evaluating laws for water data: three views…

- Law cannot guarantee legitimacy of data/experts, but it can help ensure they satisfy the needs of:
  - Decision-makers/policy-makers managing water
    → **technocratic view**
  - Lay people involved in 'water democracy'
    → **democratic view**
  - Compliance with law & reg. efficiency
    → **regulatory strategic view**



→ Is there a crisis of water data and expertise, and if so, on what view?

The critical case of groundwater and coal (seam gas)

- **High scientific complexity (data hungry)**: requires technical experts to develop data, make predictions, and attribute causes to impacts
- **Long time lags**: impacts manifest over long time periods – difficult to observe directly and respond in a meaningful way
- **High vulnerability**: vulnerability of dependent communities and ecosystems, irreversibility of impacts
- **Generally low public knowledge:** high need for digestible data
- **Enforcement is difficult by traditional methods:** activities away from public eye, high costs of detecting non-compliance
- **Most critical point of the critical case**: Cumulative impacts

Methods

- Apply evaluation framework to laws for water data in the context of coal mines and CSG
  - Legal analysis of relevant federal and state (NSW & Qld) statutes
    - Eg in NSW/Cth: *Water Management Act 2000* (NSW), *WaterNSW Act 2014* (NSW), *Dams Safety Act 2015* (NSW); *Mining Act 1912* (NSW)); *Environmental Planning & Assessment Act 1979* (NSW), *Biodiversity Conservation Act 2016* (NSW), *Protection of the Environment Operations Act 1997* (NSW), *Environment Protection and Biodiversity Conservation Act 1999* (Cth)
  - Analysis of results of survey conducted in 2016-2017
    - 104 Australian groundwater practitioners
    - Focus: challenges of managing cumulative groundwater impacts (reported in Australasian Groundwater Conference July 2017)
  - Analysis of submissions to/reports of April 2017 independent federal review of the water trigger legislation (Hunter Review)

Legal analysis

Stakeholder analysis

Results: Legal analysis (key points)

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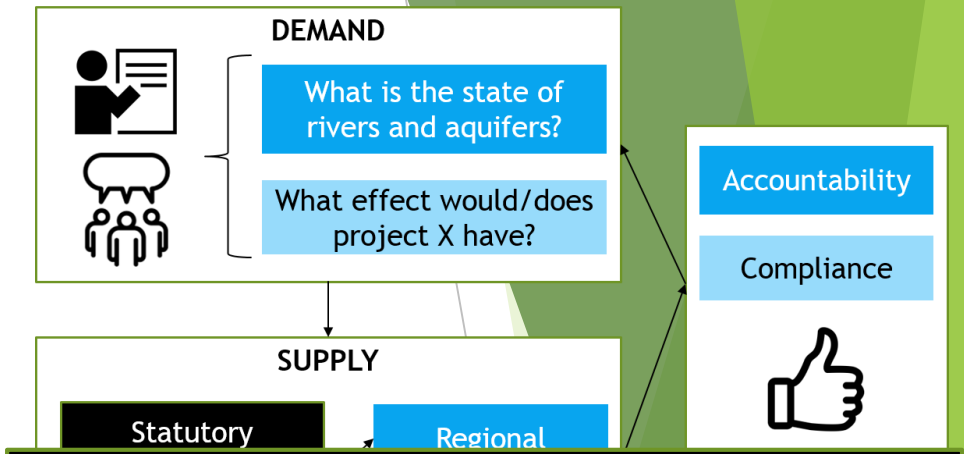
- Technocratic view
  - Regulatory silence on standards for on-ground baseline data before making a decision
  - Fewer requirements for socio-economic/cultural data (cf physical data)
  - Short timelines for expert advice & approval
- Democratic view
  - Data highly dispersed are rarely required to be shared
  - Management plans & monitoring info often difficult to access/understand
- Regulatory strategic view
  - Weak links between data & regulatory response
  - Few requirements for regulated entities to collect and share data consistently/accessibly



Some legal examples across federal environmental and state water laws…

Eg#1: Requirements for socio-economic data: bioregional assessments (s528 *EPBC Act 1999*) take a narrow view of (physical) 'science' despite legal need to consider these matters

Eg#2: Sharing of data: water licences/environmental approvals are not required to impose standardized/accessible data sharing requirements on proponents

Results: stakeholder analysis

- Survey results (gov't/proponent technical view):
  - Data = 2nd most common set of challenges (30% of identified challenges, vs law/policy concerns, 32%)
  - Top 3 data/information concerns: insufficient baseline data; unavailability of models to assess impacts; insufficient post-approval monitoring

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- Water trigger review submissions (based on sample of 50 'layperson' views, *preliminary data*):
  - In general: strong themes agreeing with survey: insufficient baseline water data + **distrust of proponent data**; model predictions too uncertain; insufficient scrutiny of proponents' monitoring data and compliance with approval conditions

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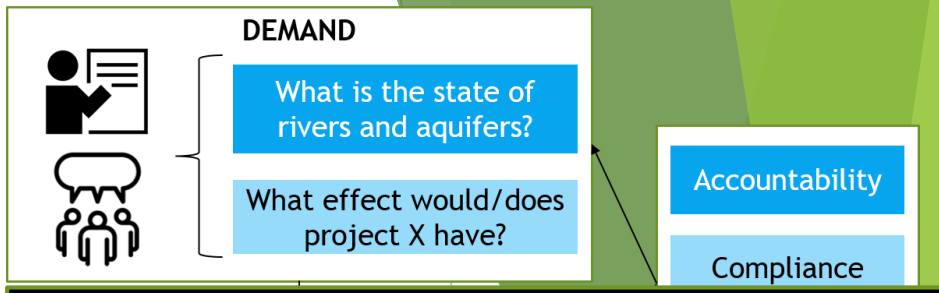
+ Need to consider local knowledge

+ Approval timelines too short for rigorous expert assessment + insufficient attention to independent expert advice/advice is not mandatory



Some corresponding legal examples across federal environmental and state water laws…

use expertise

Project-specific

Eg#1: Baseline data & law: bioregional assessments (s505D *EPBC Act 1999*) not legally linked to water trigger assessments

Eg#2: Compliance data & law: statutory state water registers contain 'bare bones' data; no public data on compliance with individual water licences

Eg#3: Attention to independent expert advice: Minister must obtain advice (s131AB *EPBC Act 1999 (Cth)*) and 'take it into account' (s136 *EPBC Act 1999* (Cth))

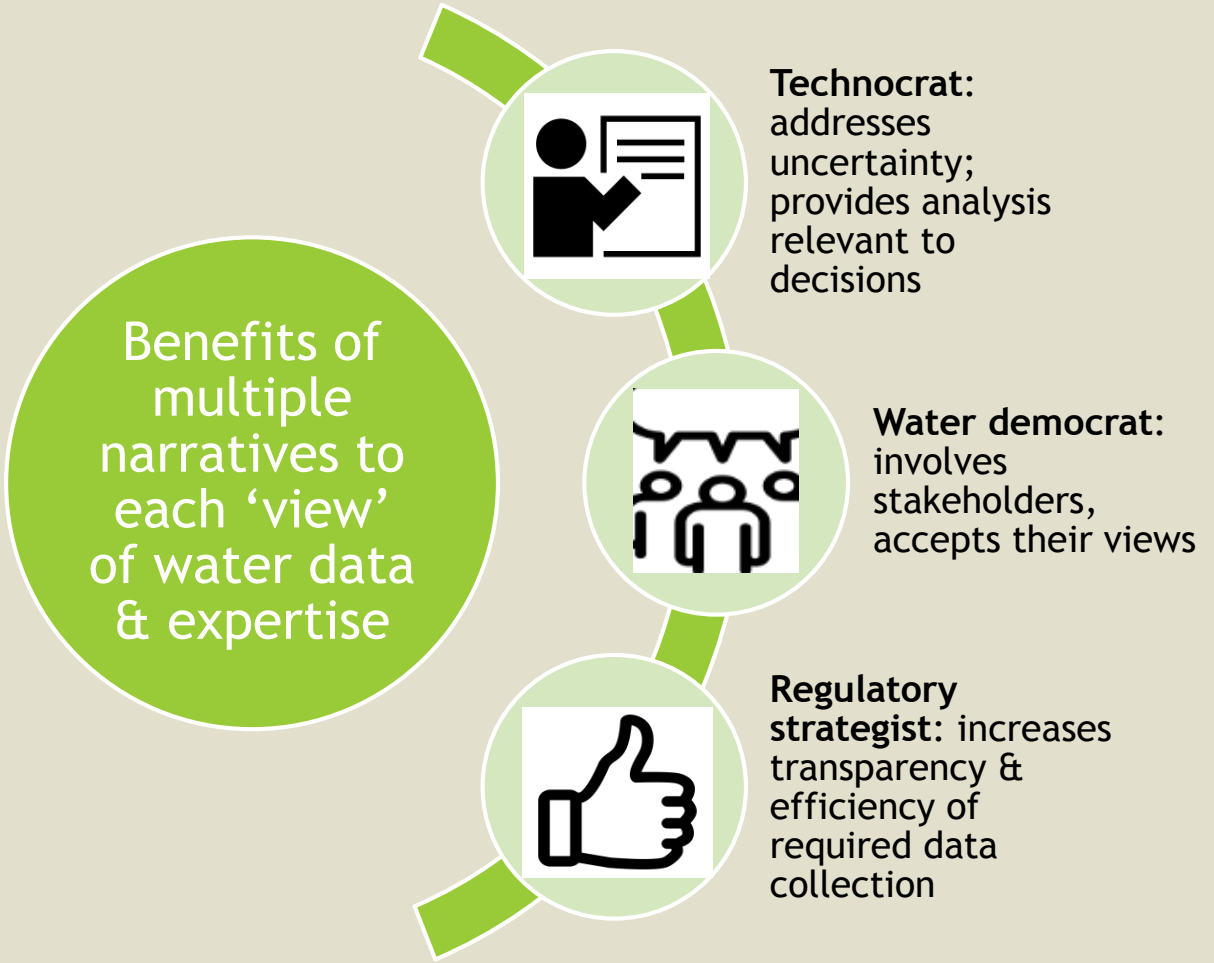
Crisis of expertise? Reflections

- If there is a crisis, to what does it relate?
  - Insufficient data → uncertainty about outcomes of decisions
  - Concerns about bias/non-use of *independent* expertise
  - Deficit of post-approval accountability
- But few fundamental concerns about use of data, models & experts to inform decisions (NB: possible effect of under-representing 'laypeople' in data sources about stakeholders)
- What can law do to address concerns?
  - To a degree – tweaks (require more and better data *before* decisions can be made, more transparency about assumptions, longer decision-making timelines, more data-sharing by proponents, better compliance monitoring)
  - BUT data paucity, uncertainty, and expense of data collection are likely to persist…

A (justified?) crisis of data/legally assured regime for data as a foundation for expertise

A suggested solution: a multiple-narrative approach to water data, models and expertise … based in law

- Ensemble modelling mimics a subjective, multiple-narrative approach to decision-making (Ferre' 2017)
- Experts accept uncertainty and possibility of unintentional bias, and use multiple, competing 'advocacy models' **informed by stakeholders to guide data collection and prediction**
- Role of law: incorporate multiple narrative process into laws for data & expertise
  - Multiple narratives, process and advocacy are law's 'comfort zone'
  - Cf 'hot-tubbing' between experts in litigation context



Key messages

1. Key weaknesses in laws for water data and expertise (legal analysis, stakeholder analysis)

2. CSG/coal mine context highlights deficits of data, independent expertise and attention to it, and accountability (→ a justified crisis of data/legal regimes for data?)

3. Opportunities

    a. Strengthen weaknesses through ‘tweaks’ to existing law

    b. Consider a multiple-narrative approach to water data and expertise

Supplementary slides

Addressing cumulative impacts on the water environment: the case of Sydney's drinking water catchments

Key
- Gather information
- Limit impact
- Both
- Weak/ strong link

State Water Law
(Water Management Act 2000, WaterNSW Act 2014, Dams Safety Act 2015 (all NSW))

State Mining Law
(Mining Act 1912 (NSW))

State Environmental Law
(Environmental Planning & Assessment Act 1979, Biodiversity Conservation Act 2016, Protection of the Environment Operations Act 1997)

Federal Environmental Law
(Environment Protection and Biodiversity Conservation Act 1999)

Regional approach

Declared dam notification areas

Special areas protection

Water sharing plans

Listed threatened species & ecological communities

Key threatening processes

Listed threatened species & ecological communities

Bioregional assessment

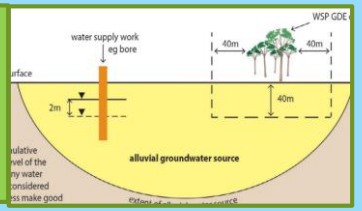
Recovery plans

IESC expert advice

Project-level approach

Water access licence

Aquifer interference approval
(*not yet in effect)



Mining lease + subsidence mgmt plan

Threatened species licence

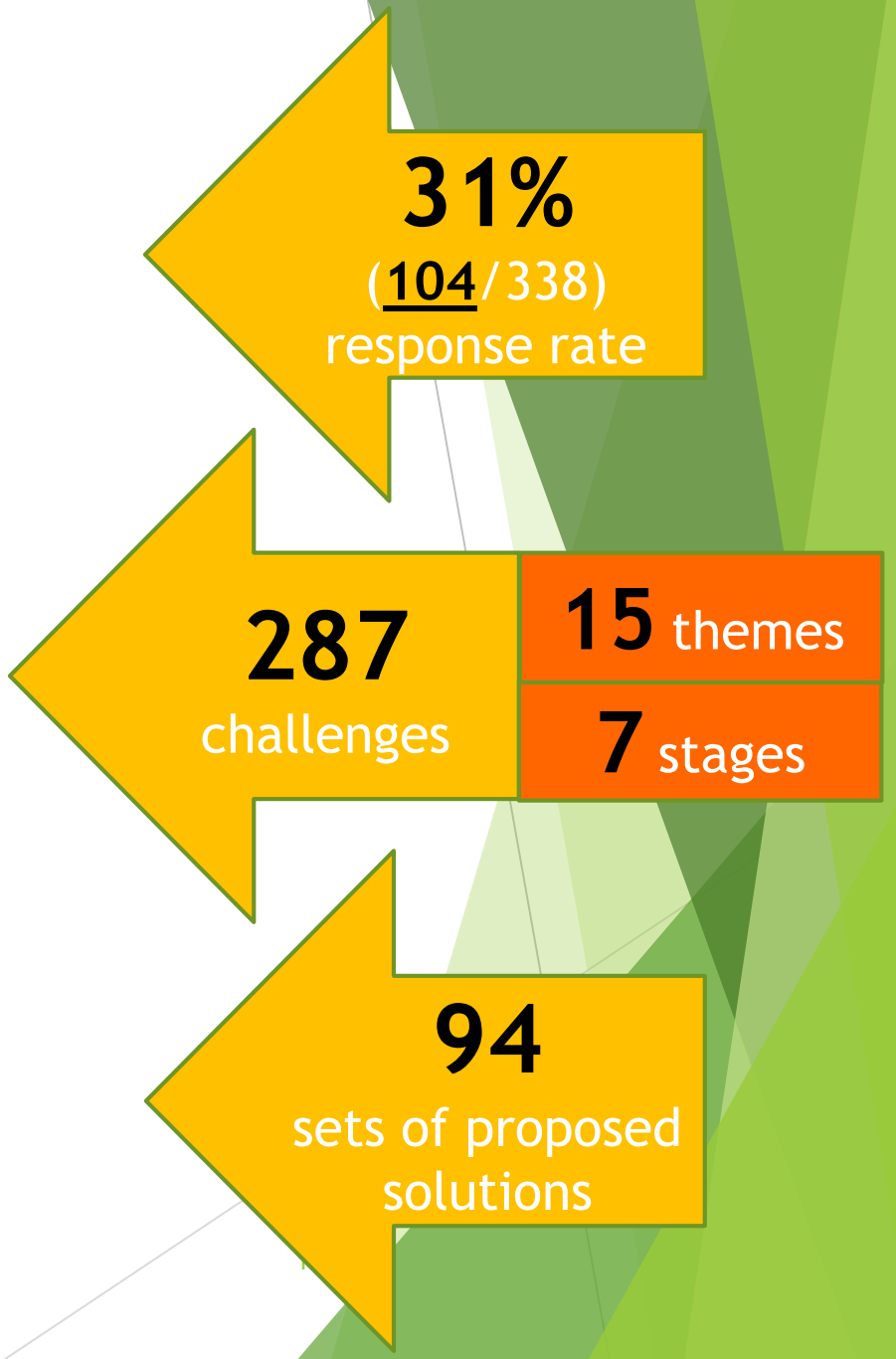
Environment protection licence

Development consent for State Significant development: assess/ approve/condition + management plans

Significant actions (water trigger and species triggers): assess/approve/condition

Method - survey

- Respondents: registrants, NCGRT/IAH Distinguished Lecturer tour 2016
- Email link (Google Forms) + some paper
- Questions
  - 3 '**most important challenges** involved in considering the cumulative impacts of a development activity on natural resources'
  - Each challenge: **importance** (1-5) + **reasons**
  - **What would help address** these challenges?



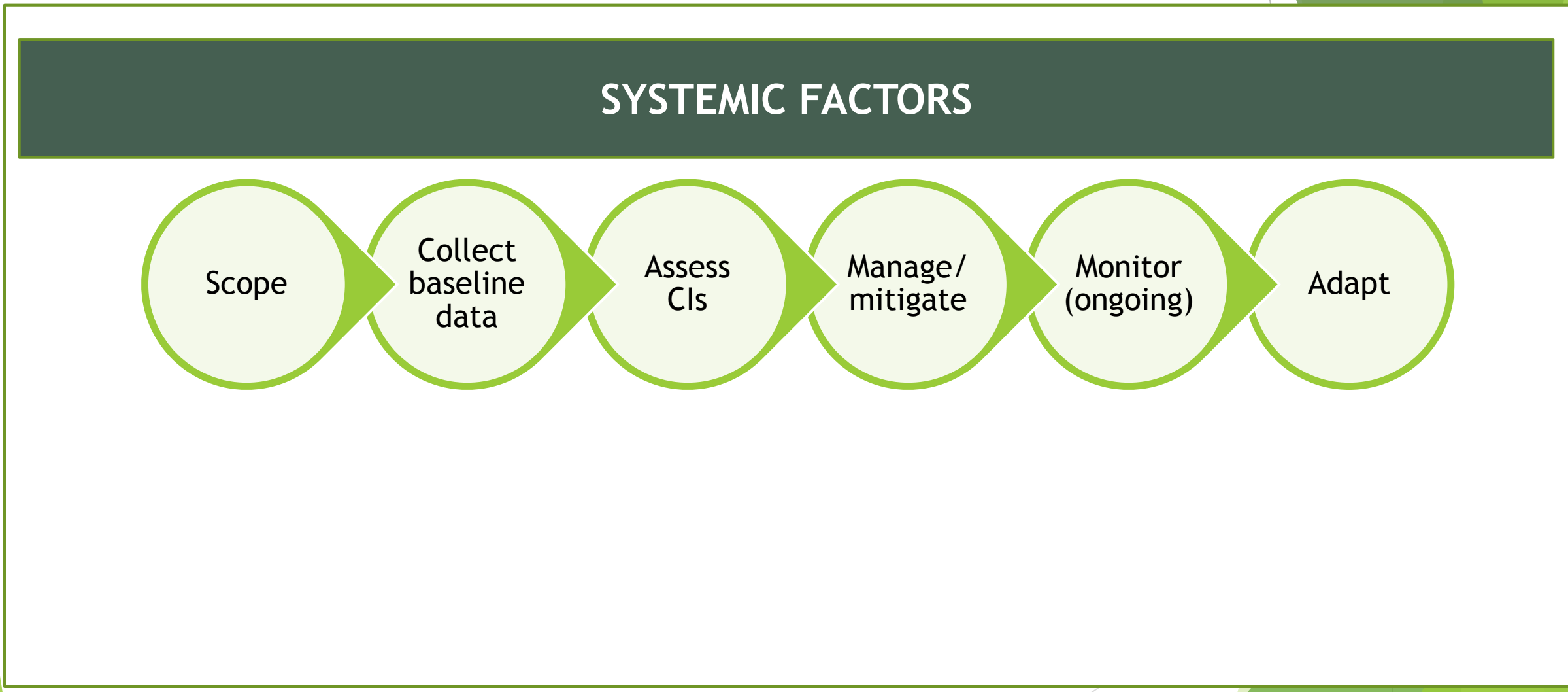
Results: most common challenges

Theme	% of challenges including theme	# of challenges including theme	Average importance
Law/regulation/policy (inc responsibility)	32%	91	4.44
Data (availability, sharing, baseline data)	30%	87	4.43
Assessment	20%	57	4.18
Behaviour/attitude	11%	32	4.31

Note: all other themes < 10% of challe *ngs 4.18 - 4.75*

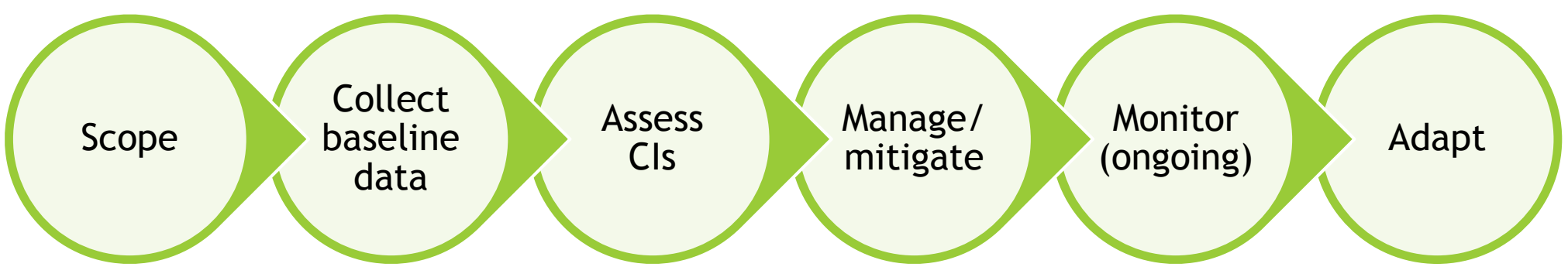
Confirms Ma et al (2012)

Results: Challenges by stage of assessment process



Results: Challenges by stage of assessment process

SYSTEMIC FACTORS



% of challenges	2%	22%	24%	4%	5%	1%
# of challenges	7	63	68	12	14	4
Average importance (1 to 5)	4.4	4.4	4.4	4.3	4.5	4.3