

building

Responsible

knowledge

infrastructures

**Climate Modelling Centres
for North-East India
2025-02-19/20**



**Centre for
Responsible
Innovation**

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- **Space for dialogue and exchange...**
- ...between scientists, technologists and society
- **Focus on ‘upstream’ engagement – where the scientific and technological action happens**
- **EXAMPLES**
 - **Survey of AI researchers**
 - Mapping public values in AI research
 - **Building human capabilities for *doing* innovation responsibly**
- **We design, build and appraise responsible research infrastructure**

Where research infrastructure are the networks of provision, material structures , technologies and devicies, networks and relations and human obligations and labour that hold them together today and over time



Experiments outside the lab come with new responsibilities

JACK STILGOE  [Authors Info & Affiliations](#)

SCIENCE • 19 Dec 2024 • Vol 386, Issue 6728 • DOI: 10.1126/science.adu7458

- Increasingly new AI is tested in the real world
- But who evaluates safety, security?
- We don't let pharmaceutical companies *test their own homework*
- So why AI?

“Reckless experiments don't just dent the reputations of one company ... They undermine the case for whole fields of innovation. With the newest cutting-edge AI models, companies have released them into the wild with little consideration of what is at stake. As we start to understand the benefits and the risks, **AI companies need to start taking more responsibility for their experiments.**”

A Survey of ~4200 Researchers in Artificial Intelligence

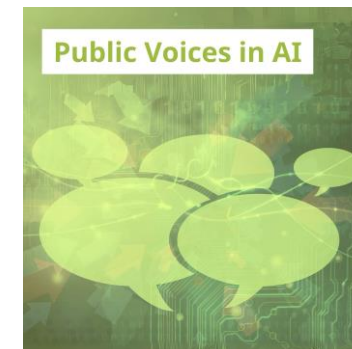
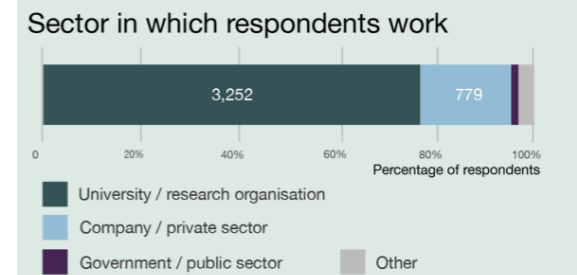
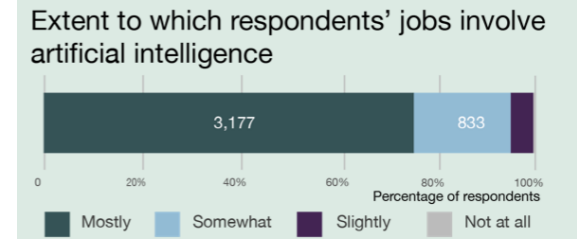
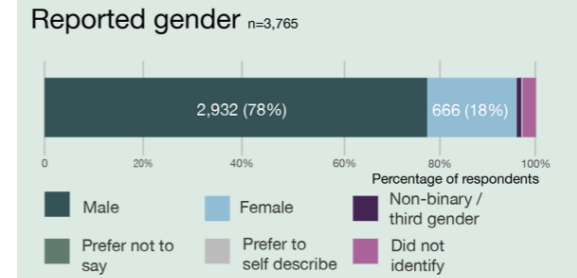
Research report

Gurakan, Wu, O'Donovan, Stilgoe,
Bert, Dmitrichenko, Gorba, Liu,
Zamborsky and Zhao
2025-03-10

[final draft]

The survey

- *Authors on ArXiv.org*
- *cs.AI, cs.LG, cs.CV, cs.CL*
- *99,516 authors emailed in June and July 2024*
- *8% response rate and 70% completion rate*
- *The final dataset for analysis contained 4,260 responses*

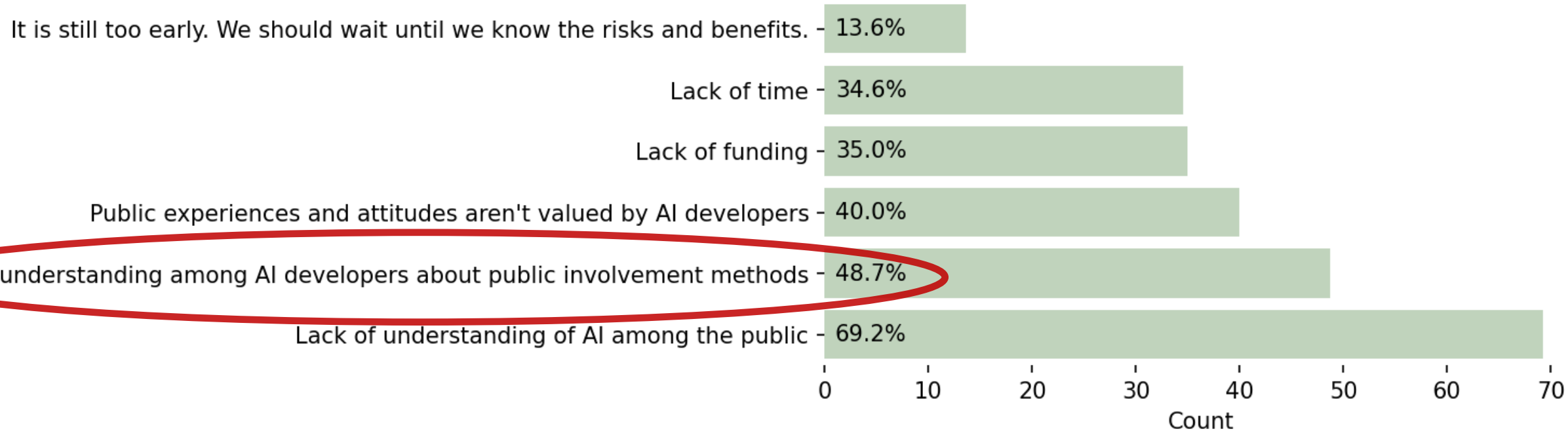


Involving the public in AI

FINDING

Researchers want AI to reflect human values but they do not pay attention to social science research – and they think a lack of understanding is a barrier to involving members of the public in their work

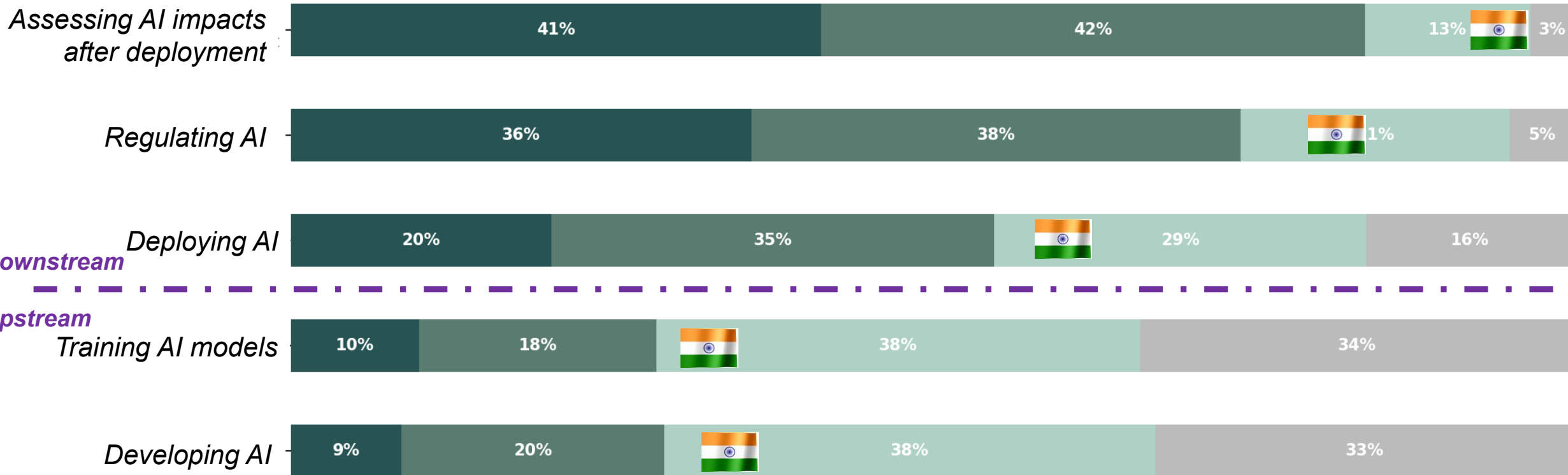
What do you think are the barriers to involving the public in AI? (Click all that apply)



Involving the public in AI

'How important do you think it is to involve the public in decisions about the following tasks?'

Extremely important Very important Somewhat important Not important the following tasks



A strong Indian faith in technology

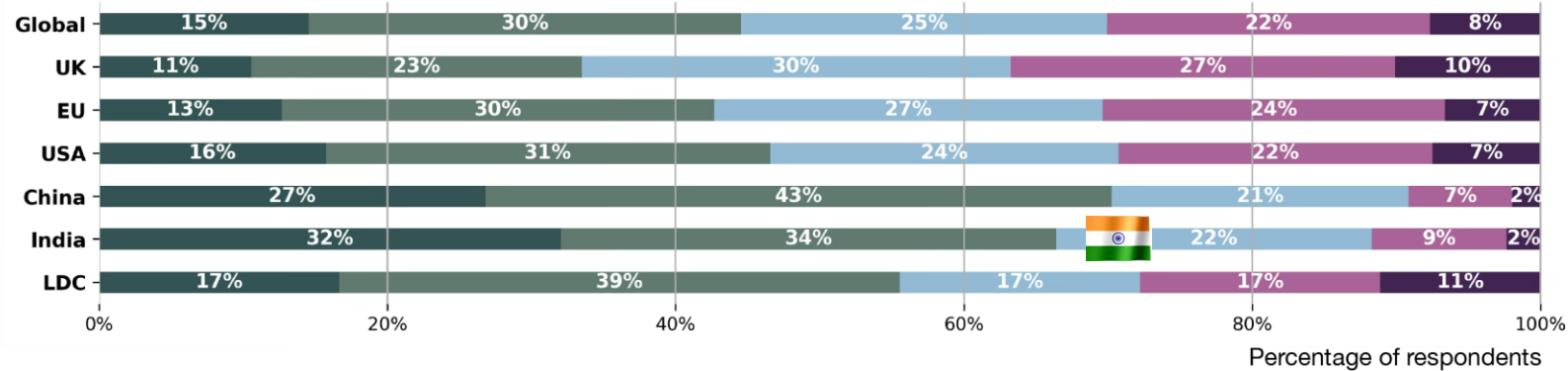
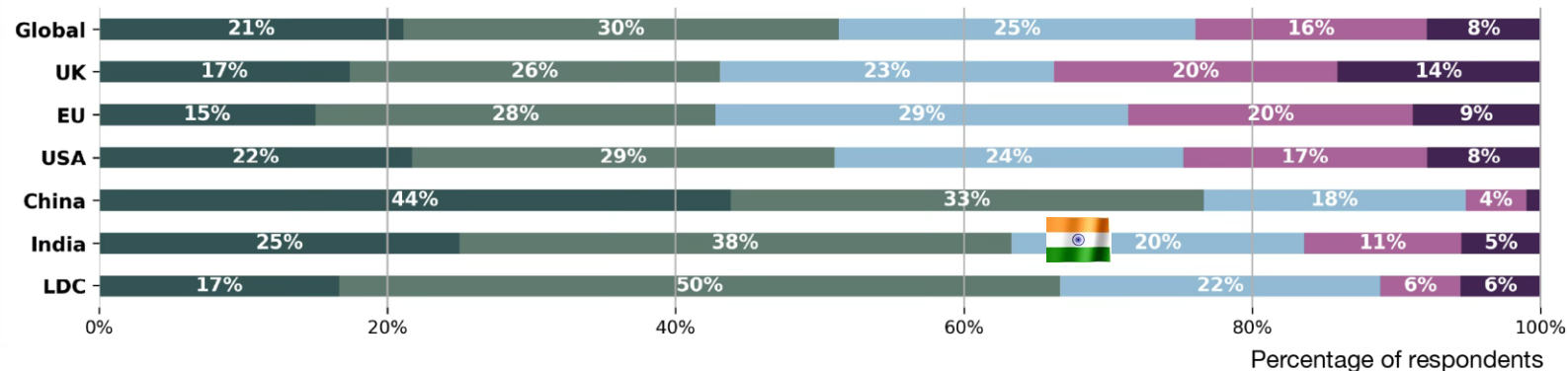
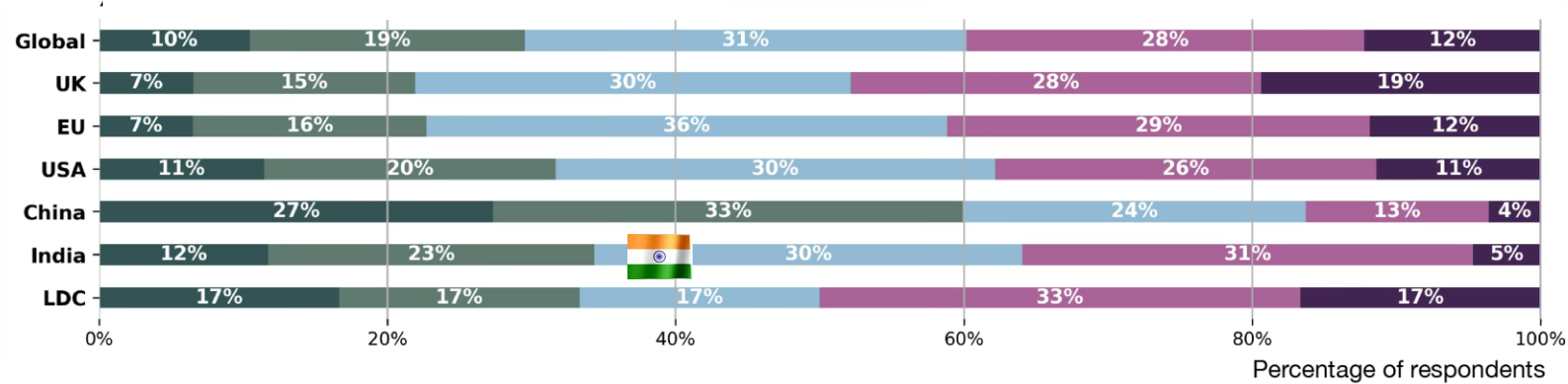
“AI should be developed as quickly as possible

“Artificial general intelligence (AGI) is inevitable

“If the public understood AI better, they would trust it more

To what extent do you agree or disagree with the following statements?

Strongly agree Agree Neither Disagree Strongly disagree



Metascience project: Mapping Public Values in AI Research (PAIR)



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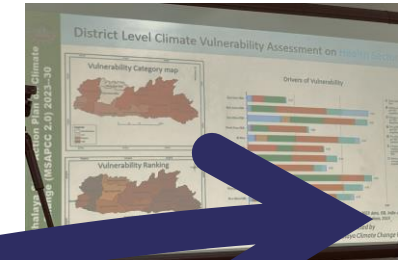
AI innovation trajectories

What society needs



Economic
and Social
Research Council

- Hypothesis: AI research is de-coupling from societal needs
- **Proxies for AI:** articles, patents
- **Proxies for needs:** SDGs, policy, qual methods
- AI for climate science as an expert domain to test?
Working with Met Office, colleagues here!?!?
- Project start: next Monday!



Responsible Innovation training for researchers

- **Capability building** amongst PhD students
 - We train 100s of PhDs and MScs across UK doctoral training centres
- Capability building critical for **empowering technologists and the public** that *other kinds* of AI and AI futures are possible
- Give technologists a way to **put AI ethics into practice** (which often seem vague)
- Is there an opportunity for **co-developing India-UK training partnerships**, as well as research?



The broader public good climate models contribute to

- **Understandings of climate change over time and space**
- Warnings, which deliver benefits and costs in turn
- **Resource allocation decisions**
- Investment decisions
- **Infrastructure decisions**
- Planning decisions
- **Local and global climate change governance**
- Gainful employment for climate analysts (incentives matter)

The problems with models – not just issues of data

nature climate change

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nature > nature climate change > perspectives > article

Perspective | Published: 07 January 2019

Taking climate model evaluation to the next level

Veronika Eyring, Peter M. Cox, Gregory M. Flato, Peter J. Gleckler, Gab. M. Lawrence, Peter Caldwell, William D. Collins, Bettina K. Gier, Alex D. Hall, Forrest M. Hoff, George C. Hurtt, Alexandra Jahn, Chris D. Jones, Stephen A. Klein, John P. Krasting, Robert Kwiatkowski, Ruth Lorenz, Eric S. Manabe, Gerald A. Meehl, Angeline G. Pendleton, Robert Pincus, Alex C. Ruane, Benjamin M. Sanderson, ... Mark A. Williamson

Nature Climate Change 9, 102–110 (2019)

17k Accesses | 225 Altmetrics

Abs

Earth system models are complex and represent a large number of processes, resulting in a persistent spread across climate projections for a given future scenario. Owing to different model performances against observations and the lack of independence among models, there is now evidence that giving equal weight to each available model projection is suboptimal. This Perspective discusses newly developed tools that facilitate a more rapid and comprehensive evaluation of model simulations with observations, process-based emergent constraints that are a promising way to focus evaluation on the observations most relevant to climate projections, and advanced methods for model weighting. These approaches are needed to distil the most credible information on regional climate changes, impacts, and risks for stakeholders and policy-makers.

AI innovation trajectories
What society needs

Habitat International
Volume 2008, July 2009, Pages 260-266

Climate change scenarios and citizen participation: Mitigation and adaptation perspectives in constructing sustainable futures

Benjamin M. Sanderson, Ulrich Gumbert, ...

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Abstract

This paper discusses adaptation and mitigation strategies as outlined in climate change scenarios. The adaptive perspective is closely connected to the concept of resilience understood as different views on nature's capacity to absorb shocks, renewal and re-organization. In constructing normative scenarios images of the future are generated illustrating potential ways of living, travelling and consuming products and services where certain goals such as a reduced climate impact are fulfilled. This paper argues that tension arising from climate strategies relying on either adaptation or mitigation strategies, or combining the two strategies, warrant further examination. In this paper the inter-relationships between adaptation and mitigation are discussed by examining processes of citizen-participation in constructing scenarios and applying the concepts of resilience, vulnerability and adaptive capacity. We discuss this using the concept of deliberative planning processes as a means to achieve legitimate, effective and sustainable futures. As a part of this approach, we argue that methods for citizen-participation applied in exploring different science and technology options also provide useful insight for this type of planning processes. The theoretical arguments are combined with examples from environmental scenario construction in practice. The paper brings attention to tensions between sustainability content values, such as reduced climate impact, and more process-oriented values such as legitimacy, learning and participatory scenario construction. Moreover, the concept of open innovation processes is introduced to the context of participatory scenario construction comparing shared ground in terms of user-involvement in search of novel solutions and also increasing robustness of action plans implemented to reduce climate change.

Science of The Total Environment
Volume 744, 20 November 2020, 140945

'Opening up' the governance of water-energy-food nexus: Towards a science-policy-society interface based on hybridity and humility

Alberto Matenauer Urbinatti, ...

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https://doi.org/10.1016/j.scitotenv.2020.140945

Habitat International
Volume 2020, January 2021, 102661

Better research through more participation? The future of integrated climate change assessments

Patrick Scherhafer

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https://doi.org/10.1016/j.futures.2020.102661

Highlights

- The integration of non-scientific actors into science remains a constant challenge.
- Participation in IAs is always subject to a goal-oriented management function.
- Assessments remain dominated by science, and top-down structures prevail.
- Future assessments must focus more on their democratic and egalitarian design.

Abstract

Conducting an integrated assessment of climate change is an attempt to bridge the gap between science, policy and practice. The aims of such transdisciplinary assessments are to integrate knowledge from different scientific disciplines, to produce reliable and useful results and to inform subsequent decision-making processes. In order to attain various functions of participation like better knowledge integration, the improvement of the quality of decision-making or the democratisation of knowledge the involvement of non-scientific actors like citizens, lay people or decision-makers became an integral part of these assessments. In a comparative study four different integrated assessments of climate change are investigated. Based on a normative, instrumental and substantive rational of participation the article provides a critical assessment of the significance and importance of participation and makes suggestions towards a more egalitarian and democratic design of future projects.

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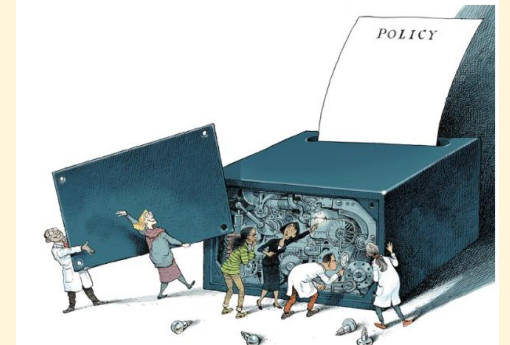
COMMENT | 24 June 2020

Five ways to ensure that models serve society: a manifesto

Pandemic politics highlight how predictions need to be transparent and humble to invite insight, not blame.

By ...

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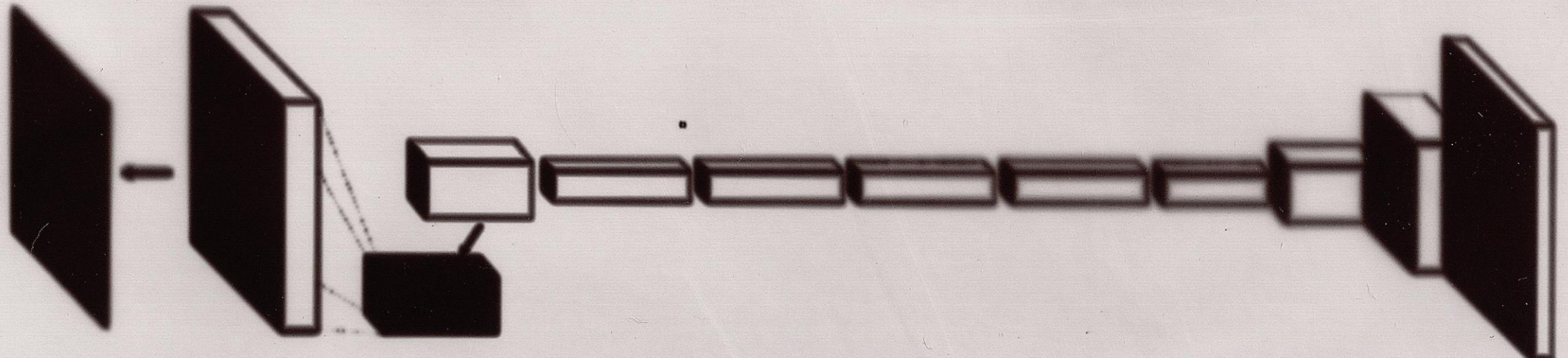


1. Workshop aims

Enhanced Climate Modelling Capabilities	<ul style="list-style-type: none">• Technical capabilities: do they add risk, complexity and cost?• Human capabilities required at the data and policy interface
Capacity Building: Researchers and students at IIM Shillong/ NEHU will gain knowledge and skills in AI and climate modelling, enabling them to lead future research and policy initiatives focused on regional climate challenges	<ul style="list-style-type: none">• Leading climate science requires interdisciplinary skills, not just AI knowledge
Stakeholder Engagement and Policy Impact: Local governments and policymakers will be engaged throughout the process, ensuring that model outputs and recommendations are actionable and aligned with regional development goals	<ol style="list-style-type: none">1. What does the policy interface look like?2. What is the trust funnel between data creation, data analysis / ML and putting decisions to use for, e.g. allocating resources. Mitigate against tendency of AI/ML outputs to assume consensus decisions3. Engagement needs to be sustained before and after

So, let's build some responsible research infrastructure

- To create new policy and public interfaces – critical for responsible *data-in* and *data-out*
- To make *AI-informed* decisions accountable
- To build interdisciplinary capacity & human capabilities
- To better understand AI models and the modelers who build them



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thanks

end