

A best practice framework for co-created citizen science

Heather Sugden

Danielle Robinson, Jane Delany

The Context

WARNING



Flood warnings



▶ **Storm Eunice: Met Office issues amber warning for 100mph winds in Wales**



Coronavirus: The month everything changed

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UK and Global extreme events – Heatwaves

Millions in Bangladesh impacted by one of the worst floodings ever seen

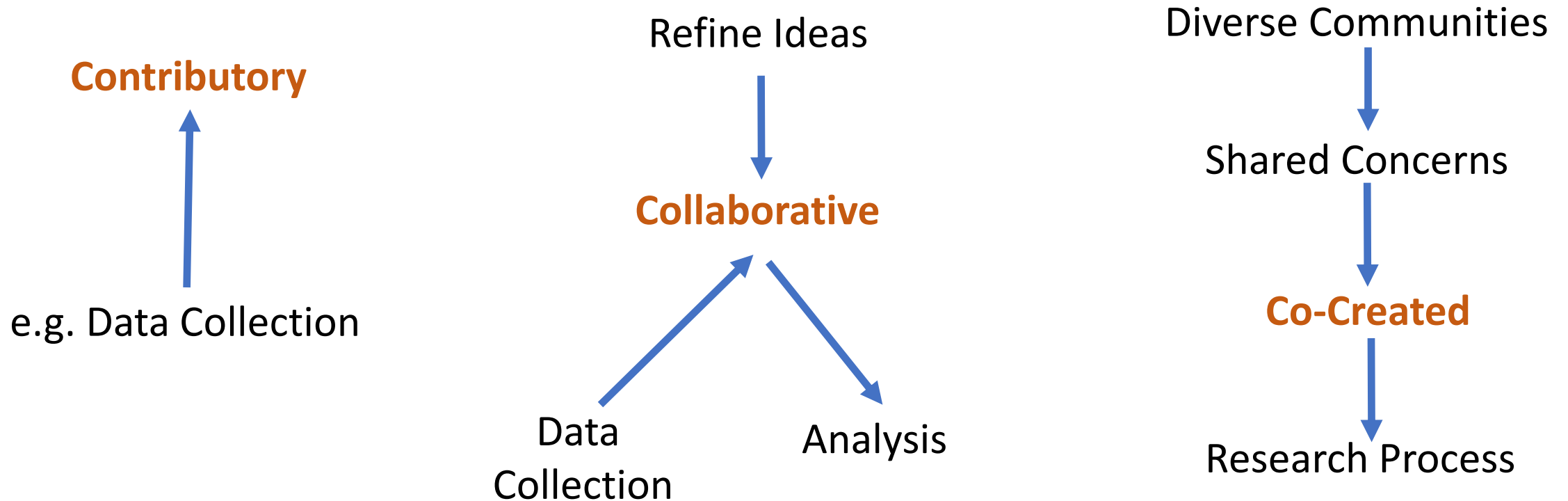
28/06/2022 | Press release



A Bangladesh Red Crescent volunteer carries a small child on his shoulder as he walks through flood water in Meghalaya, Bangladesh. The area was hit by record-breaking flooding in June 2022, affecting an estimated 7.2 million people.

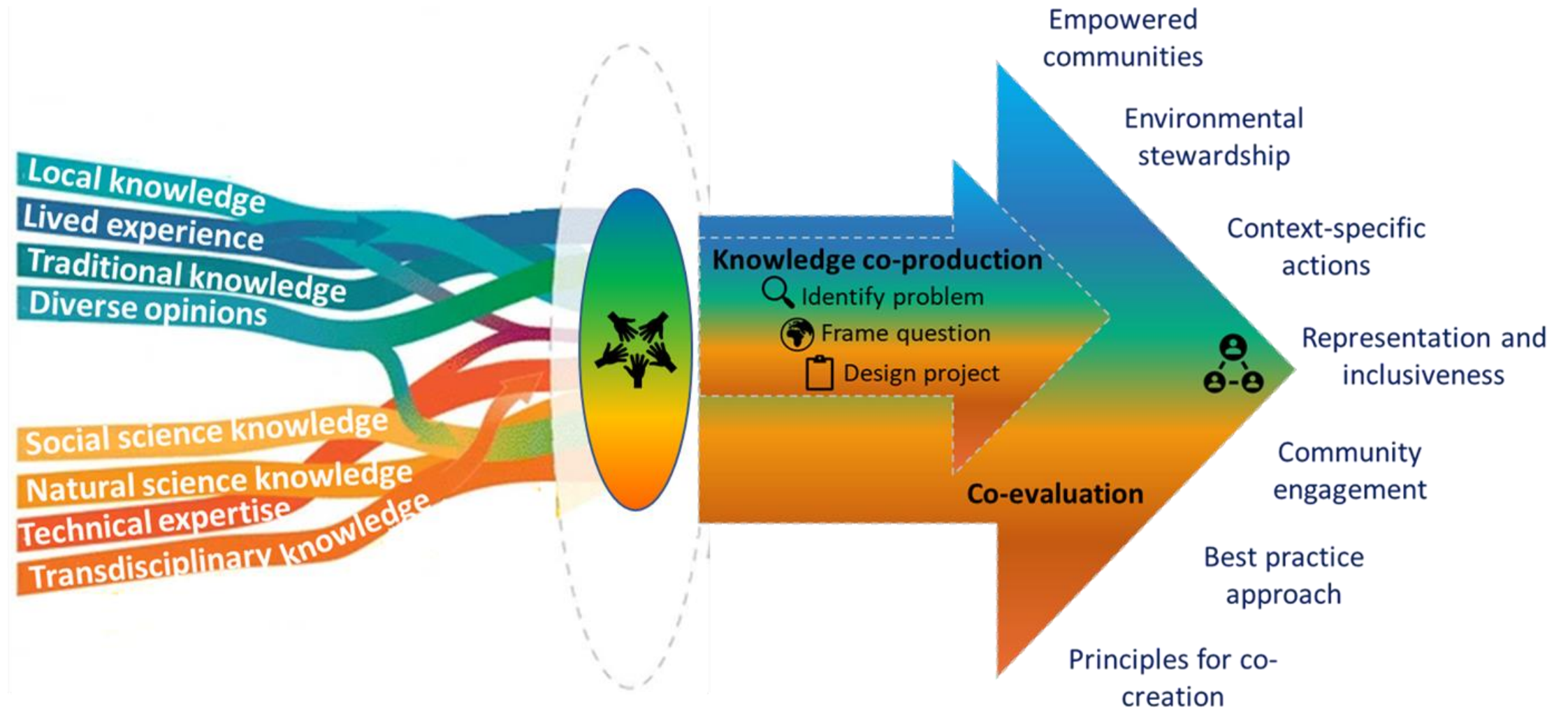
Photo: Bangladesh Red Crescent Society

Three Phases of Citizen Science



.....addresses **community concerns** related to our **local environment** by engaging citizens as **co-researchers**

A Roadmap for Future Empirical Work



Co-creation processes where the integration of diverse knowledge systems can enrich understanding of shared concerns and build community capacity to respond through context-specific projects and actions that represent local interests. Adapted from Ziervogel et al. (2021).

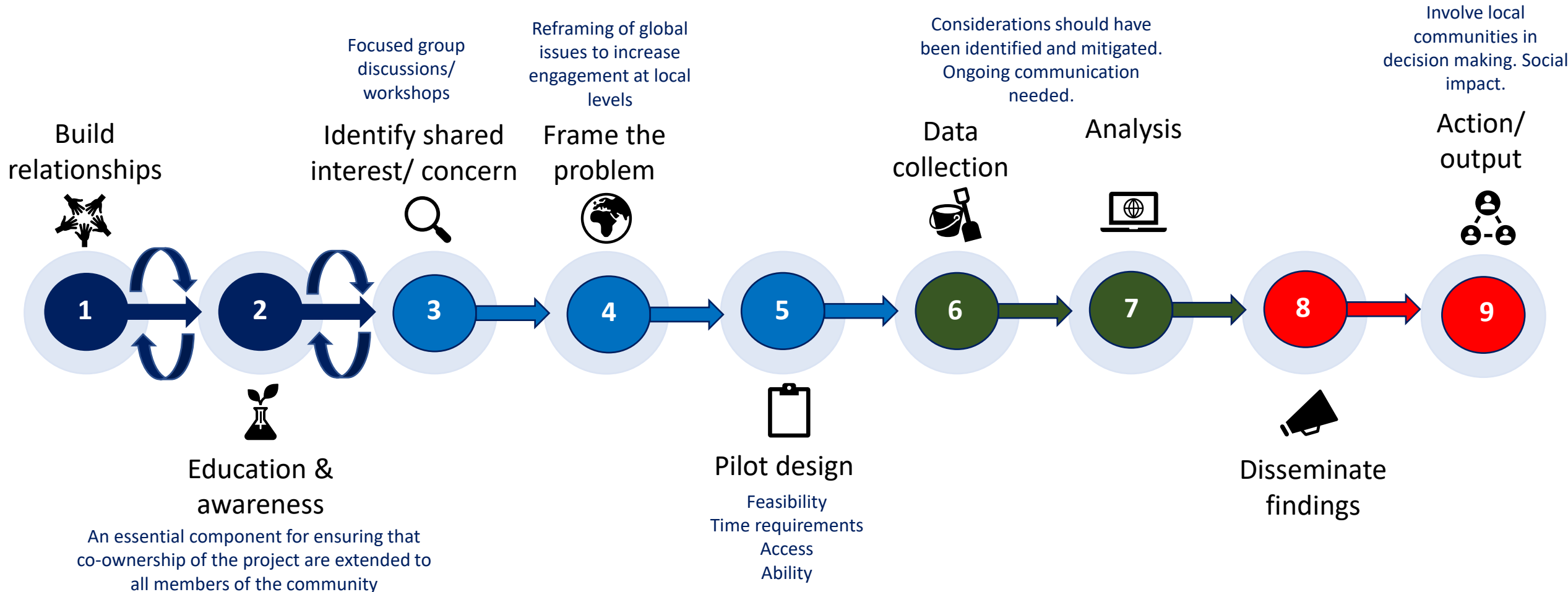
Method: The Approach

Phase 1: Education & outreach

Phase 2: Identify problem & co-design

Phase 3: Deployment

Phase 4: Action



Method: The Co-Creators

Plastic pollution



- Eastern European and BME women's group
- Beach litter monitoring

Science-Art collaboration



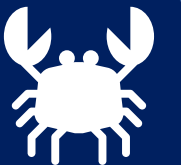
- Bangladeshi women's group
- Creative workshops

Intertidal biodiversity



- Youth group
- Intertidal surveys

Marine ecological communities



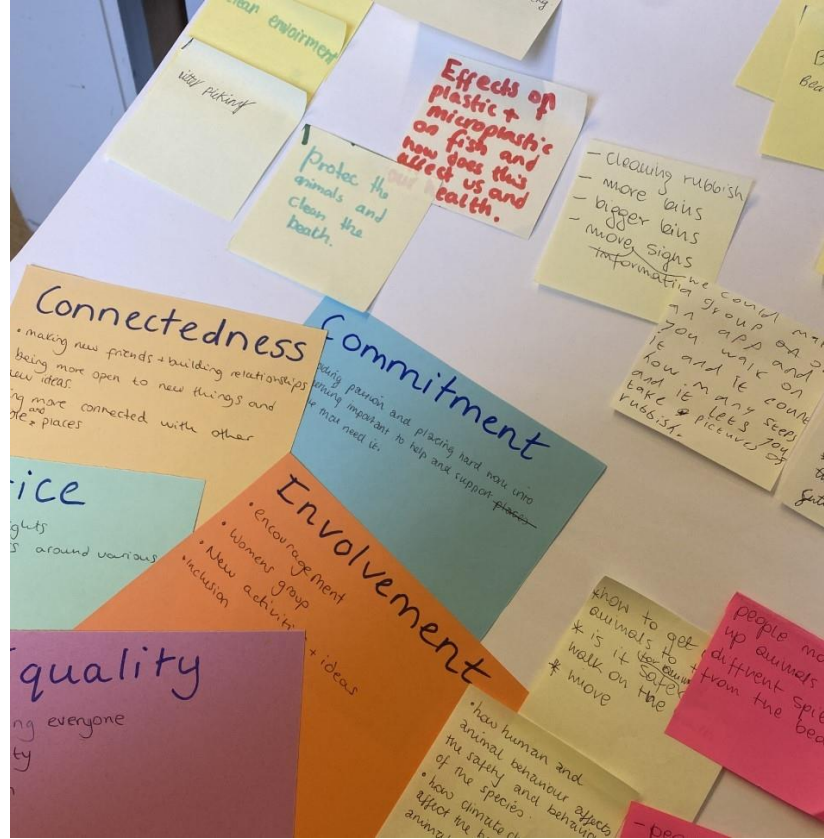
- LGBTQ+ group
- Behavioral study



Phase 1: Education & outreach

- Thematic workshops
- Practical activities

- Rocky shore exploration
- Relationship building



Phase 2: Identify problem & co-design

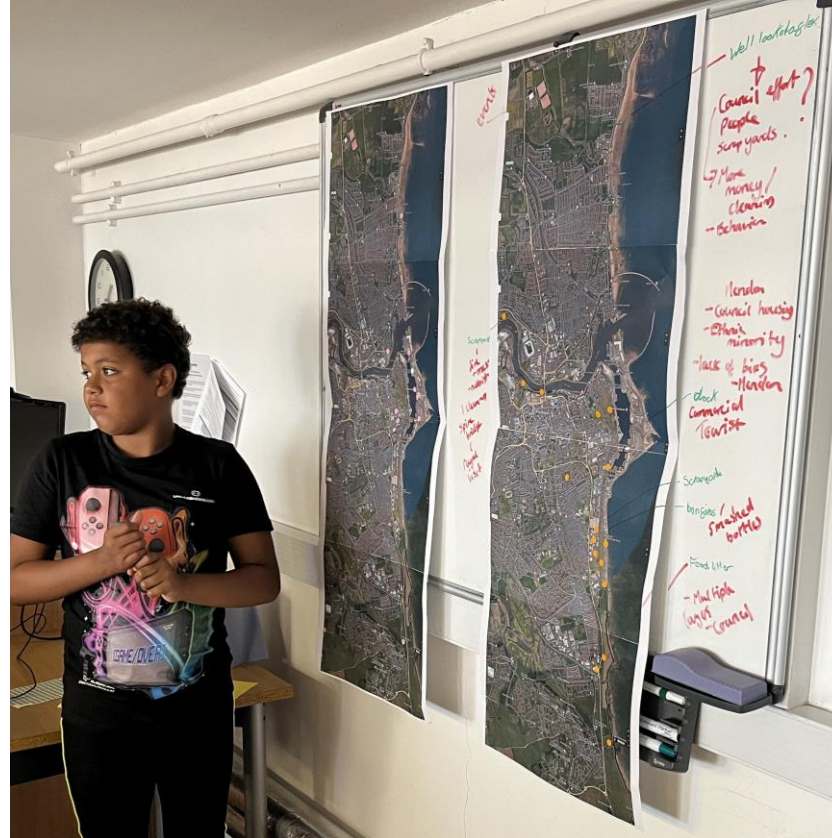
- Participatory workshops
- Brainstorming
- Training
- Community concern central
- Participatory mapping



Phase 3: Deployment

- Data collection
- Data analysis

- Participatory artwork
- Knowledge co-creation
- Storytelling



Phase 4: Action

- Participatory workshops
- Co-design change

- Raise awareness
- Raise visibility
- Lobbying for local change

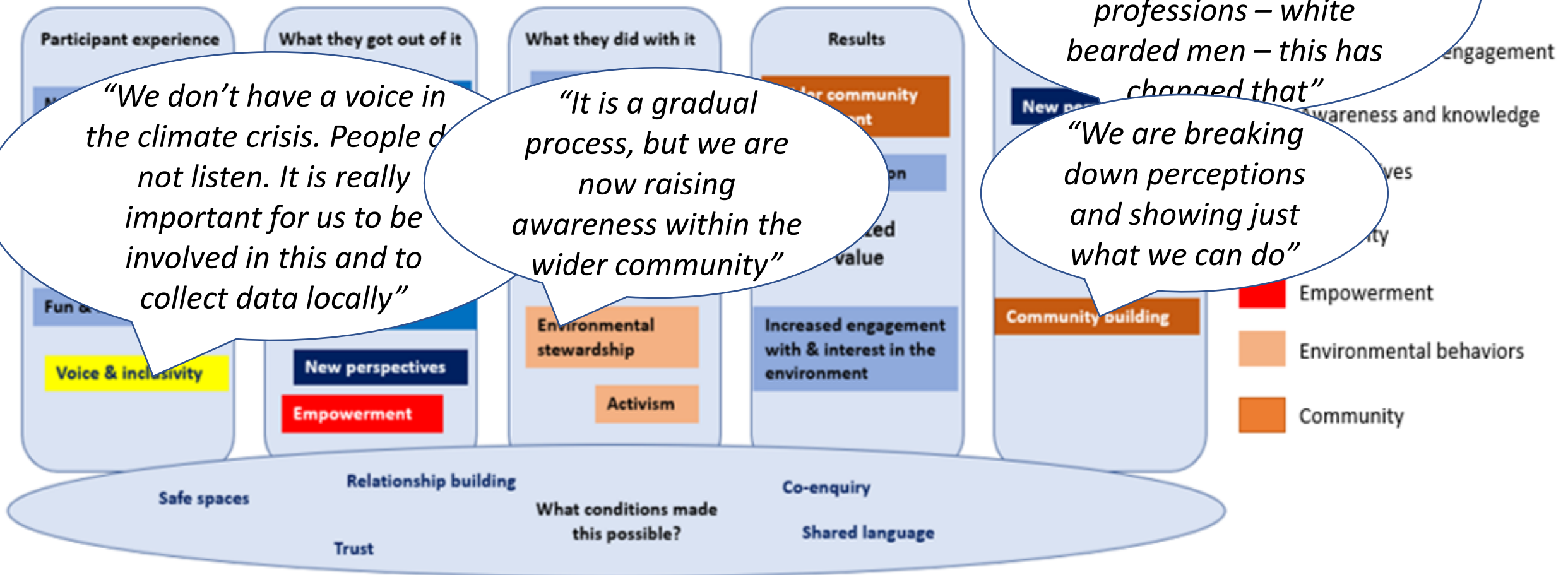
Capturing Value – Beyond Science

Value Creation Framework

Cycle 1: Immediate value	Cycle 2: Potential value	Cycle 3: Applied value	Cycle 4: Realised value	Cycle 5: Reframing value	Cycle 5: Transforma- tional value
Participant experiences	What they got out of it	What they did with it	Results	Redefining success	Wider impact

We used qualitative and quantitative survey approaches to capture, thoughts, feelings and behaviours relating to participation in the project. This was guided by the Value Creation Framework proposed by Wenger et al 2011.

Results: Transformative Eng



Interest & Engagement – Significantly increased from beginning to end of project: $P < 0.001$

Empowered Communities - Significantly increased from beginning to end of project: $P < 0.001$

Results: Guiding Principles

Guiding Principle 1: Value the process not just the outcome

Recommended Practice 1

Researchers need to shift from a narrow view of impact to a more inclusive lens

Recommended Practice 2

Researchers must critically reflect on whether a co-created approach is appropriate and continually reflect throughout all project phases

Recommended Practice 2

Value people, not boxes

Results: Guiding Principles

Guiding Principle 2: Ensure the appropriate conditions are in place for inclusive co-creation

Recommended Practice 4

Recognise the value of intermediaries

Recommended Practice 7
Research vs outreach – the importance of a knowledge foundation

Recommended Practice 6

Language

Recommended Practice 5

Take the time to understand what a 'safe space' means to each community group.

Recommended Practice 8

Ethics, consent and crediting

Results: Guiding Principles

Guiding Principle 3: Participatory research requires participatory evaluation

Recommended Practice 9

Evaluation as an integrated
research activity

Recommended Practice 10

Results of project evaluations
should be disseminated

Conditions needed for Co-creation

Co-evaluation

- Iterative process – evidence-based change
- Quantitative & qualitative
- Participants actively involved in decision on project goals and preferred evaluation approach

Safe spaces

- Flexible & adaptable
- Community values
- Ground rules
- More than a physical space

Language

- Knowledge co-creation
- Marginalised voices
- No jargon
- Translators
- Art - expression

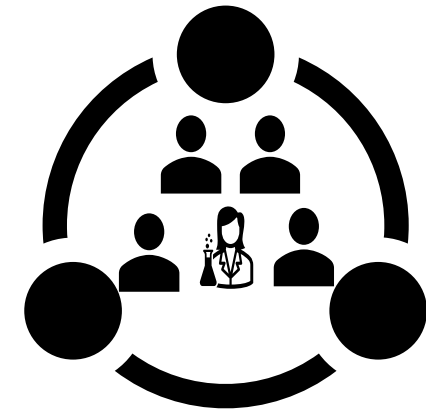
Research vs outreach

- Participatory workshops
- Environmental awareness
- Extends co-ownership of project
- Empowerment

Ethics, crediting & consent

- Dynamic consent – live iteration
- Co-authorship
- Ownership – data

Equality between participants



Inclusive, flexible, adaptive

Acknowledgements



Youth Climate Group



ICOS



Thank You

Engaging Environments 452 funded by the Natural
Environment Research Council (Grant number:
NE/S017437/1)