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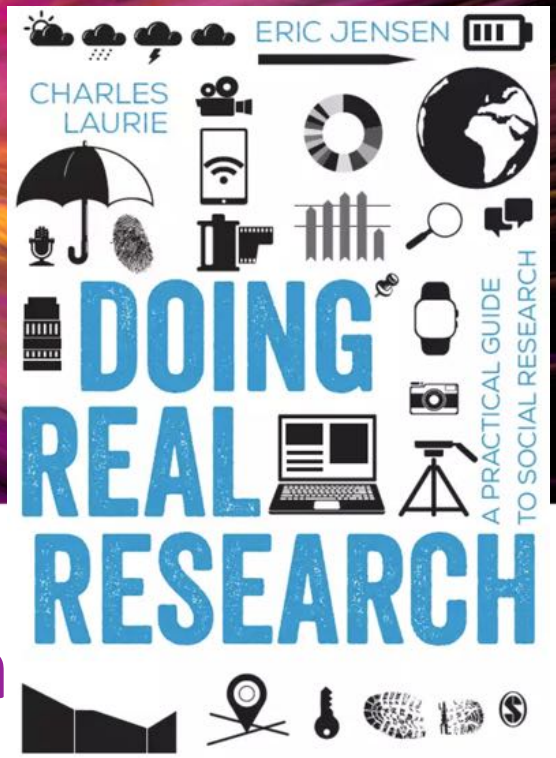


Future of Science Communication

Dr Eric A. Jensen (e. jensen@warwick.ac.uk)

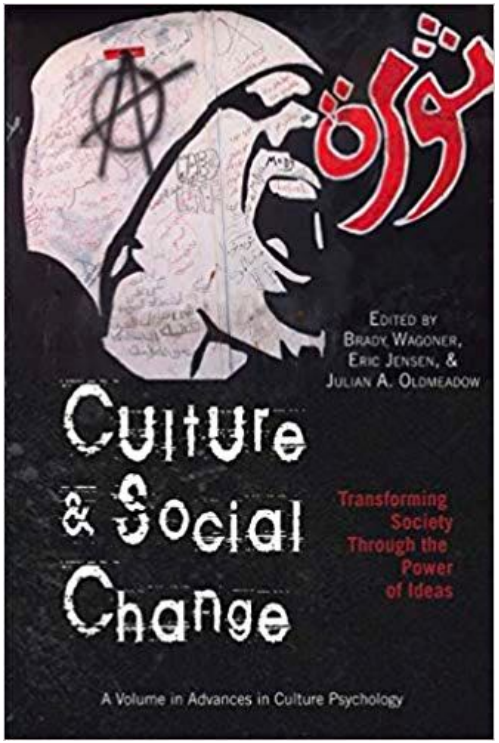
Background

- Academic background:

-Communication (US)
-Psychology (US)
-Sociology (UK)

- PhD, Sociology

UNIVERSITY OF CAMBRIDGE



Forthcoming book in Public Communication of Science & Technology (PCST) series:
'***Science Communication: A knowledge base***'

Background

Current main roles:

1) Sociology professor, University of Warwick
   - Teaching social research methods
   - media audiences and social change
   - founded MSc in Science, Media & Public Policy (*no longer live*)
2) Senior Research Fellow, ICoRSA (icorsa.org)
   - European Commission-funded projects relating to responsible research and innovation

   (**RRING.eu; GRRIP.eu**)

100+ Engagement & Impact-related Publications

Experience

Ireland-specific:
-Space Week
-SFI Science Week 2018
-Probe (Dublin); Cork Discovers (UCC)
-Supporting TCD, SGD, UCC in European Commission-funded evaluation and research projects
-Abbott Fund
-Abbvie Foundation

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Qualia Analytics
Valuable insights with
Technology - enhanced research solutions

qualiaanalytics.org

TeRRIFICA.eu; eu-project-o.eu

Experience

NATURAL HISTORY MUSEUM

UNIVERSITY OF CAMBRIDGE

UNIVERSITY OF CAMBRIDGE
Science Festival

national museum wales

CHESTER ZOO

THE TIMES
CHELTENHAM FESTIVALS
SCIENCE

CAMBRIDGE FESTIVAL OF IDEAS

THE NATIONAL GALLERY

IWM
IMPERIAL WAR MUSEUMS

UNIVERSITY OF CAMBRIDGE

UNIVERSITY OF CAMBRIDGE
MUSEUMS
& BOTANIC GARDEN

OXFORD UNIVERSITY
MUSEUM OF
NATURAL
HISTORY

University of Glasgow

Trinity College Dublin
The University of Dublin

UNIVERSITY OF OXFORD

SCIENCE GALLERY

SCIENCE MUSEUM GROUP

DUBLIN MAKER

ZOO COPENHAGEN

MANCHESTER SCIENCE FESTIVAL
Supported by Siemens

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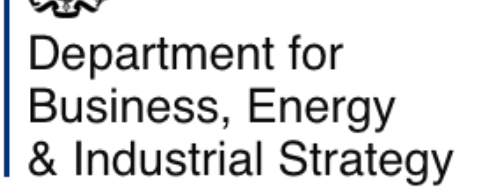
HELSINKIZOO.FI

exploratorium

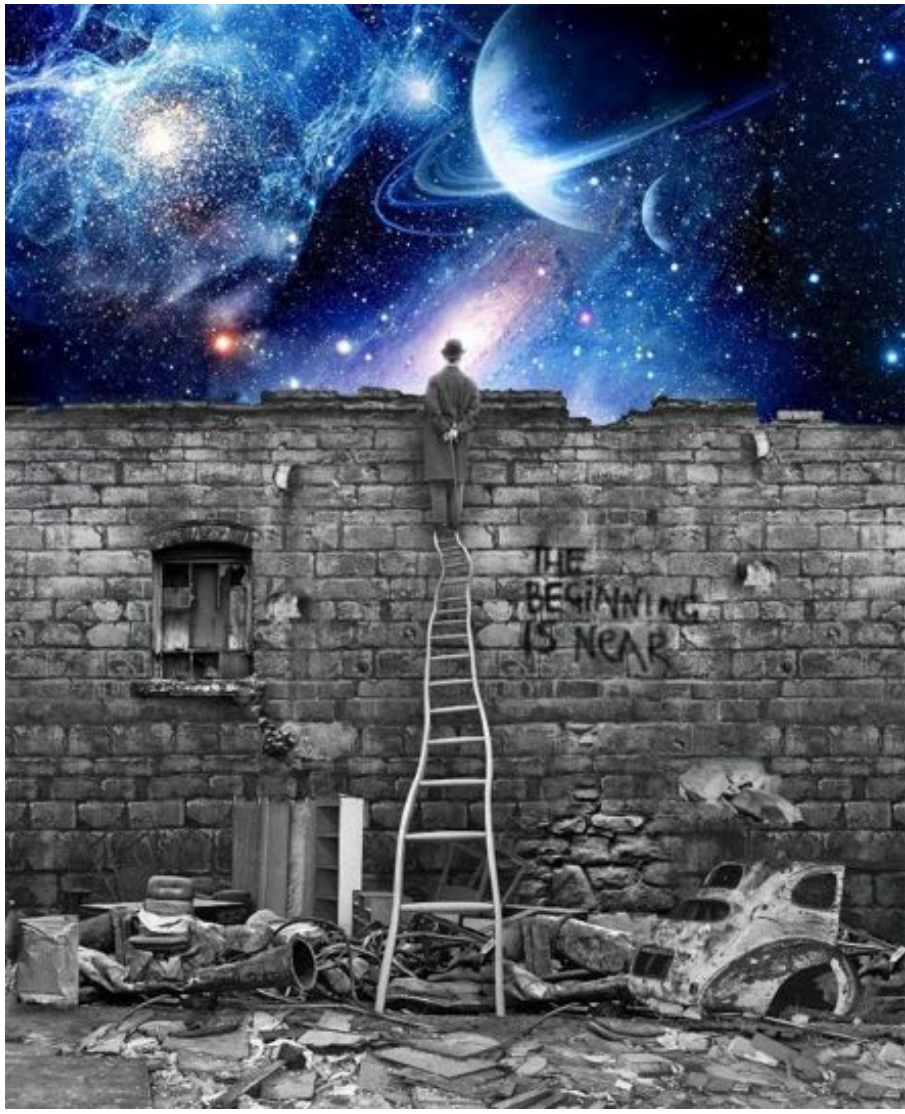
Experience

esa

European Space Agency



Future of Science Communication is **evidence based**



- Committing to continually improve practice based on ongoing collection and analysis of evaluation evidence.

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OVER TO YOU!
(5 minutes discussion)

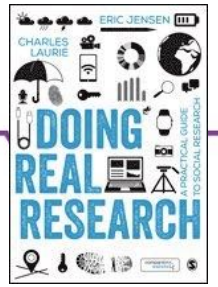
1. What do you know about your audiences?

- Audience profile
- Most effective methods of engagement
- Impacts

2. HOW do you know about your audiences?

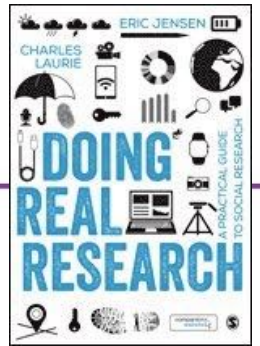
Why Evaluate?

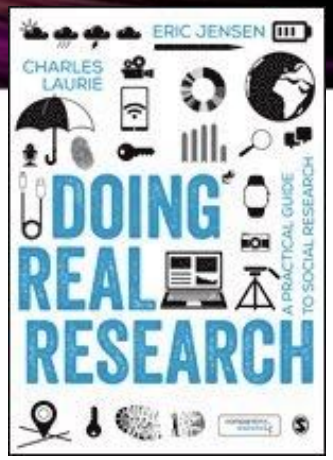
- *To build* a better understanding of your visiting publics, (e.g. needs, interests, motivations, language).
- *To inform* your plans and *to predict* which engagement or learning methods and content will be most effective.
- *To know* whether you have achieved your objectives (and why or why not).
- *To re-design* your approach to be even more effective in future.



What is Evaluation?

- Evaluation = sub-category of 'social research' (thus principles of good social research apply)
- Distinguishing feature of evaluation: **Focus on objectives / claimed outcomes** (*practitioners must specify these outcomes*)
- In order to evaluate them, practitioner objectives should be Specific, Measurable, Achievable, Realistic and Targeted.

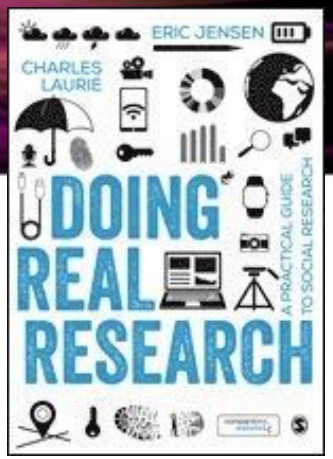




Developing effective evaluation

1. Ensure the outcomes you're interested in evaluating are measurable.

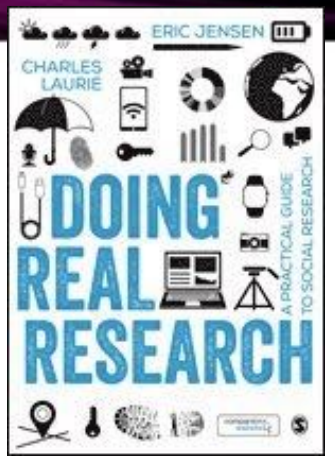
2. Develop a clear, realistic evaluation question.



Distinction between activity/output and intended outcomes

For outcomes, think about, ‘How might the person who attends the activity be different at the end of the experience?’. How will they have changed?

(e.g. improved confidence in discussing art)



- ***Outputs*** - direct products of program activities.
  - may include types, levels and targets of services to be delivered by the program.
- ***Outcomes*** – specific changes in program participants' behaviors, knowledge, skills, status, emotions, etc.

Activity	Delivery Methods	Immediate Responses	Intended Outcomes of Specific Program	Contribution to Institution-level Impact Goals	Supporting Evidence	Contrary Evidence
[Describe a single component of the larger program]	[How is this activity delivered using particular objects, techniques, etc. that may be employed across multiple activities?]	This activity will generate the following [immediate responses, e.g. pupil behaviors, feelings or thoughts] during the program delivery	This activity will lead to change or strengthening in [aspects of knowledge, skills, behavior, etc.] OR This activity will reduce the prevalence of a problematic idea, behavior, etc.	[This activity contributes to] X, Y and Z institution / project-wide impact		

Intended Outcomes should be Measurable

- The evaluation process begins with a concept / idea that there is an interest in measuring or observing. (e.g. 'learning')

The Evaluation Process: 1st steps

- Process of ensuring that intended outcomes are spelled out in concrete, measurable variables is very important.
- Define concepts by what they 'do'.
  - How would you know that a particular kind of change has happened?
  - Think about what you would observe if the outcome was being realised in practice.

An example –
Teacher CPD programme

The outcomes of this activity will be:

- To guide teachers in the exploration of the collection, following a similar process that they would use with their pupils.
- To lead teachers in their exploration of teaching approaches in front of paintings in the Gallery, using pictures with themes in common with the focus picture.
- To demonstrate up-to-date knowledge of theories underpinning best teaching practice and how these relate to the collection and the workshop.

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- To demonstrate up-to-date knowledge of theories underpinning best teaching practice and how these relate to the collection and the workshop.

- **None of these are outcomes.**
- **These are aspects of the activity itself (that is, this is describing outputs not outcomes)**

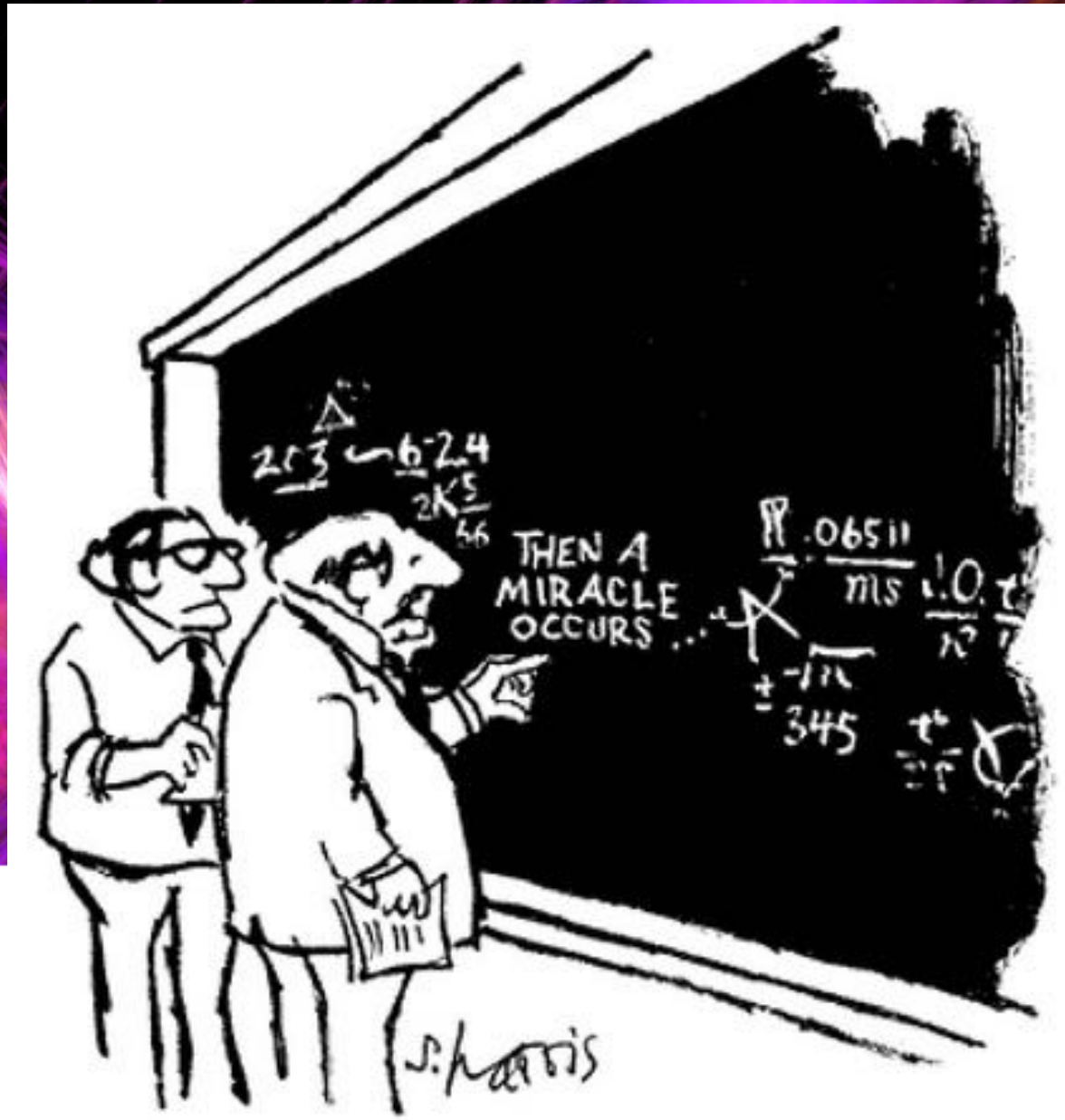
Outcomes emerging from consultation

- Teachers will be more capable of linking art to non-art subjects
- Teachers will be more confident linking art to non-art subjects
- Teachers will have more confidence in visual analysis of paintings
- Teachers will have more confidence in their ability to sketch
- Teachers will tell other teachers about their experience at the Gallery
- Teachers will have developed a more extensive professional networks within and between schools (social capital)

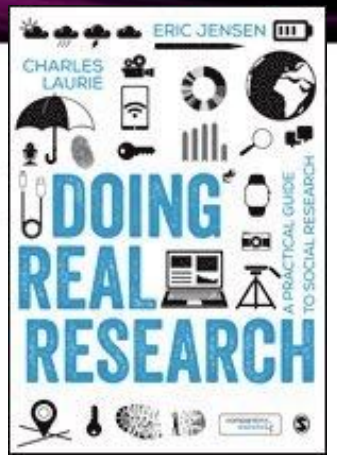
OVER TO YOU!

- What **outcomes** are you aiming to achieve with your participants or audiences?
- Define **at least one** clear outcome for your activity.

Theory of Change

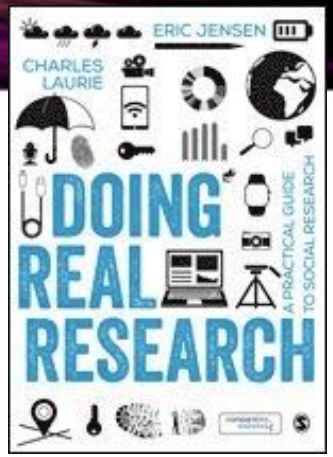


"I think you should be more explicit here in step two."



Theory of Change =
Comprehensive description / illustration of **how** and **why** a desired change is expected to happen in a particular context.

Theory of Change



- Mapping out or "filling in" what has been described as the "missing middle" between what a program or change initiative **does** (its activities or interventions) and how these lead to **desired goals**.
- Focus on precise links between activities and achievement of long-term goals/outcomes

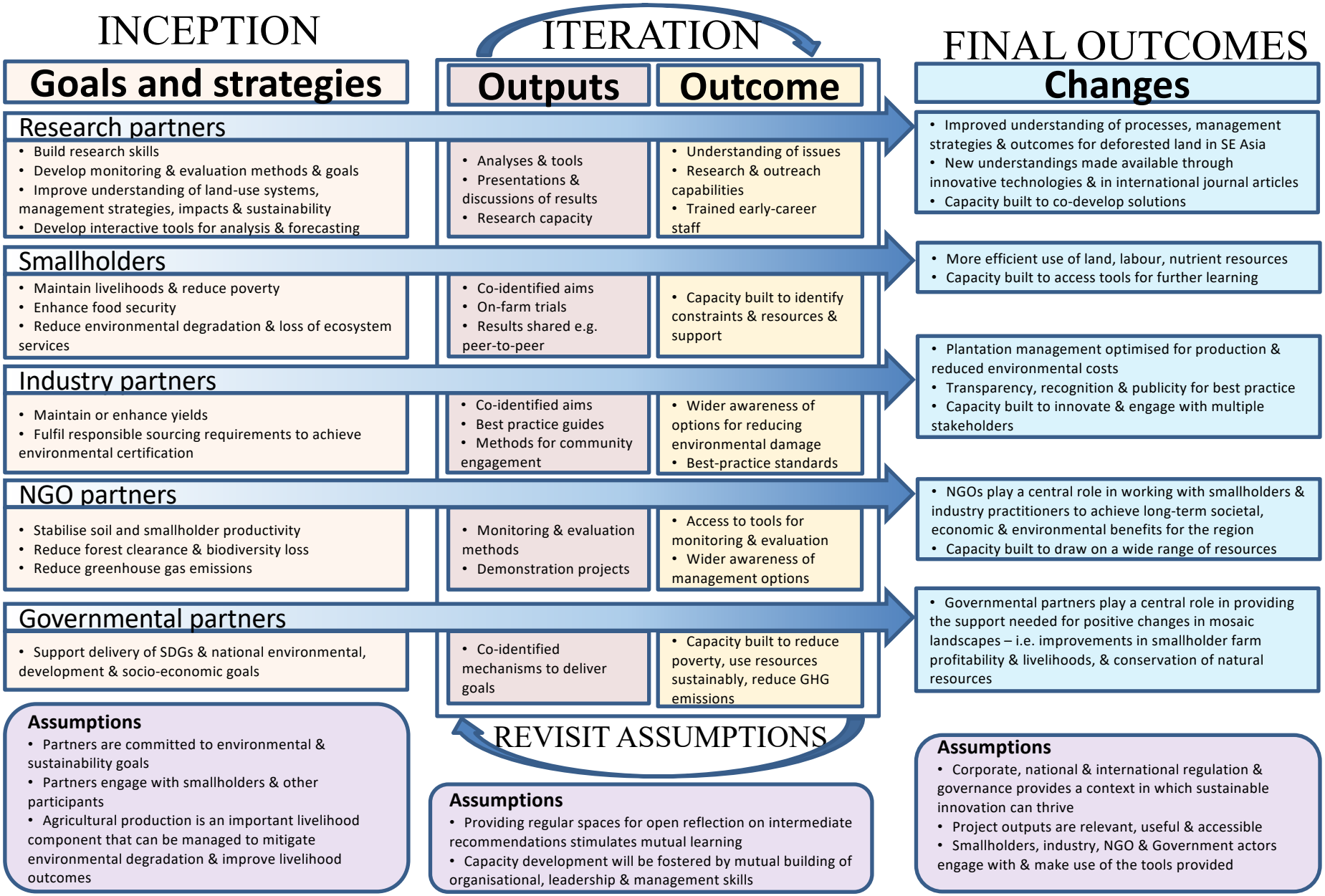
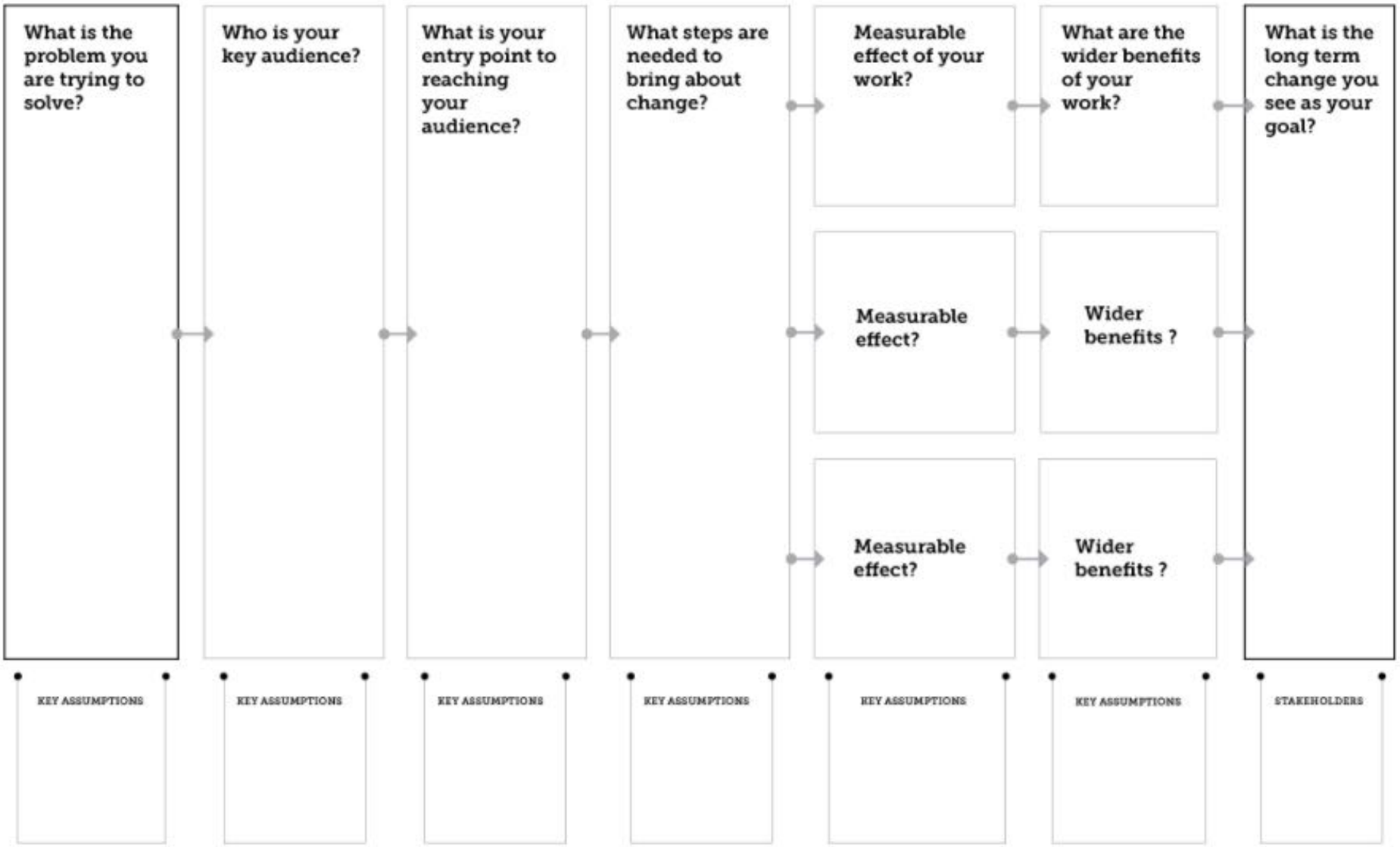


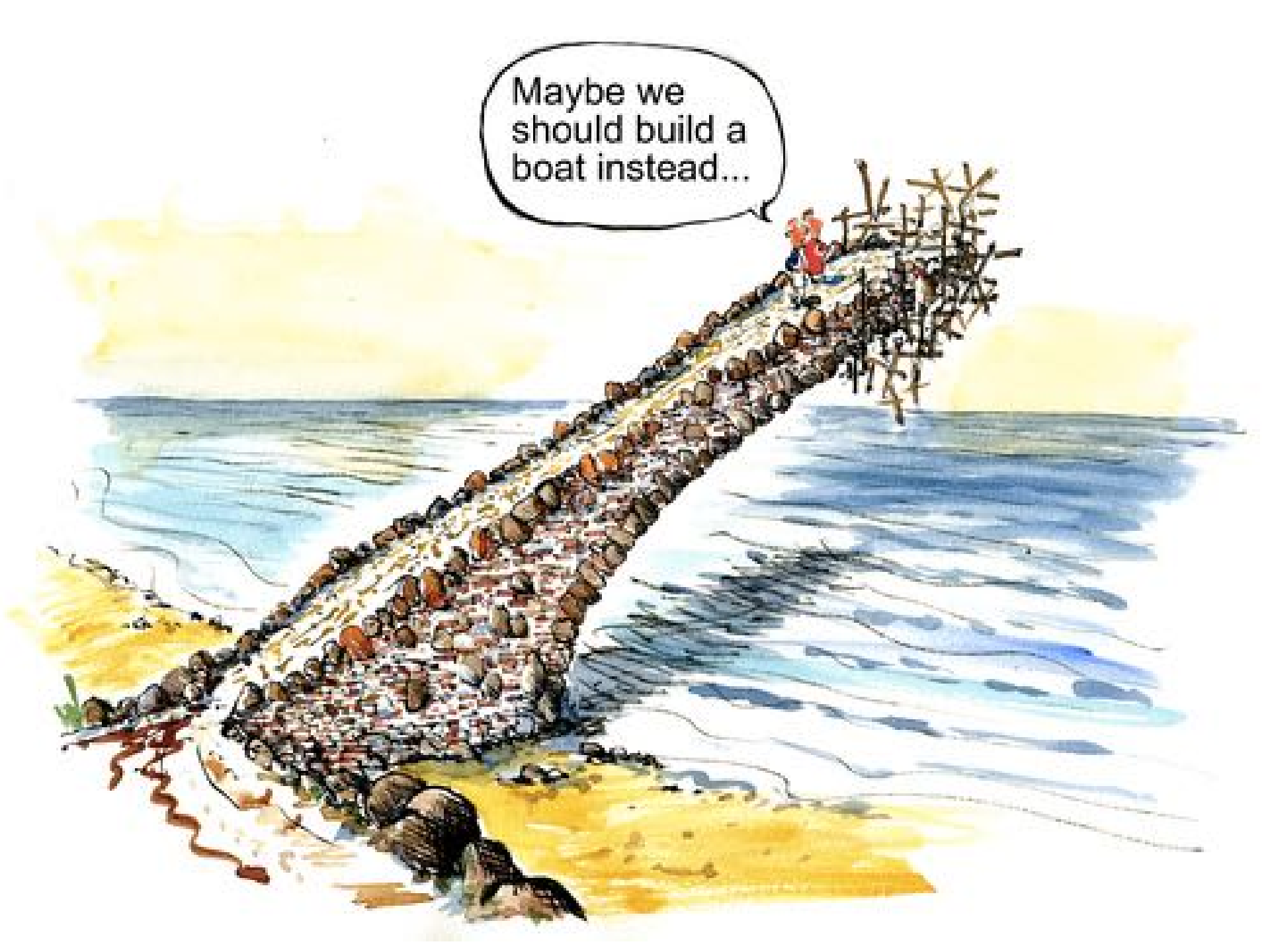
Figure 1. Theory of change for the project, illustrating how desired changes will be defined and achieved.

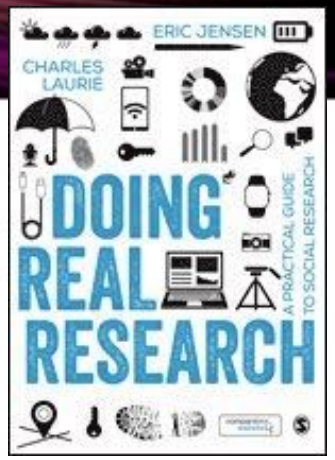
fasttrackimpact.com/toc

I want to clarify my priorities
by defining my goals and the path to reach them

THEORY OF CHANGE




Maybe we should build a boat instead...



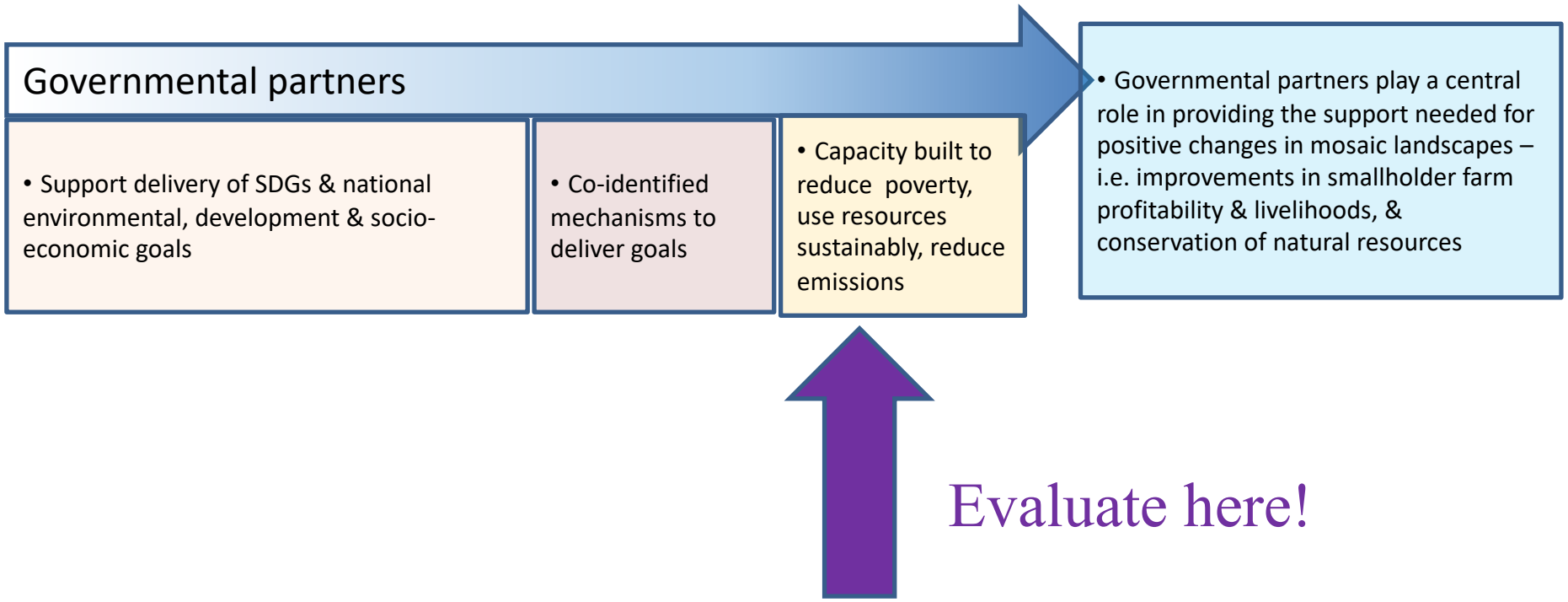
Over to you – Discuss for your project/activity:

What is the problem you are trying to solve?	Who is your key audience?	What is your entry point to reaching your audience?	What steps are needed to bring about change?

OVER TO YOU!
(10 minutes discussion)

- What is a theory of change leading to the **outcome** you identified?
- Define **at least one** theory of change for your activity / intervention.
- Aim for **consensus** in your group

Your evaluation design targets pathways to impact identified in theory of change



What can impact evaluation evidence look like?

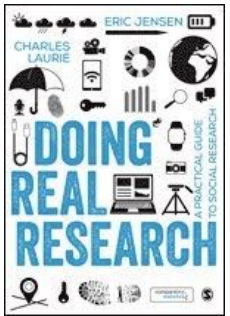
Impact Evaluation: Defining Impact

- Impact is the overall net outcomes or results of an activity or intervention (intended or unintended) for individuals or groups
- Note that changes or ‘impacts’ can be in negative or dysfunctional directions!

Examples of impacts from public engagement

- *Understanding and awareness* e.g. people understand an issue better than they did before
- *Attitudes* e.g. a new appreciation for alternative views and more positive perceptions of people who hold different views
- *Behaviours* e.g. more tolerance towards people who hold different views, more engagement with issues via other activities
- *Culture* e.g. a change in the nature of public discourse around an issue
- *Capacity or preparedness* e.g. access to knowledge or resources that were previously unavailable, which can be used at a time of need
- *Policy*

From: fasttrackimpact.com

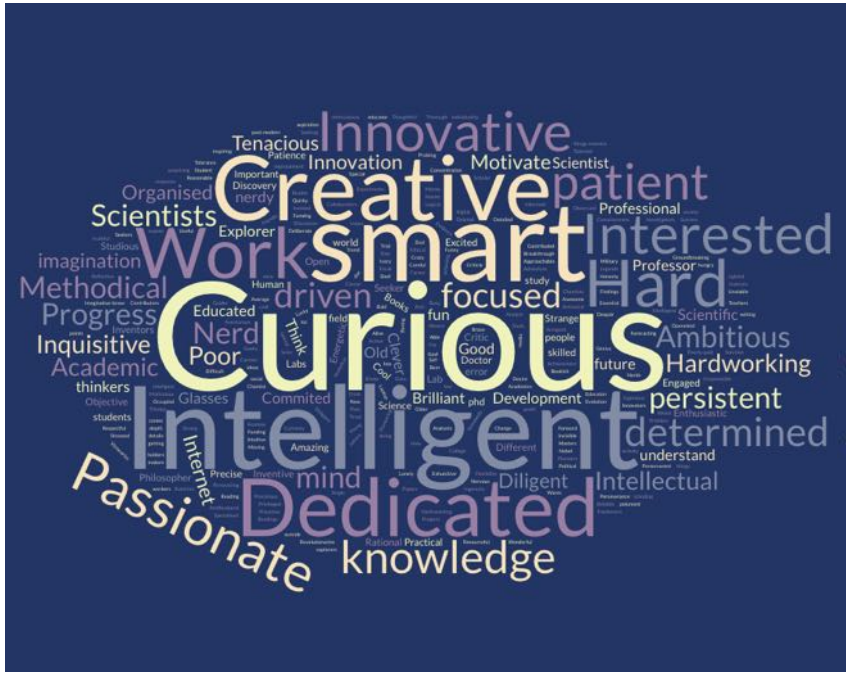


Impacts could include:

- Development in learning about a specific topic
- Attitude change
- A greater sense of self-efficacy
- Enhanced curiosity or interest in a subject
- Improved skills or confidence, etc.

‘What comes to mind when you think of researchers?’ (Ireland)

PRE

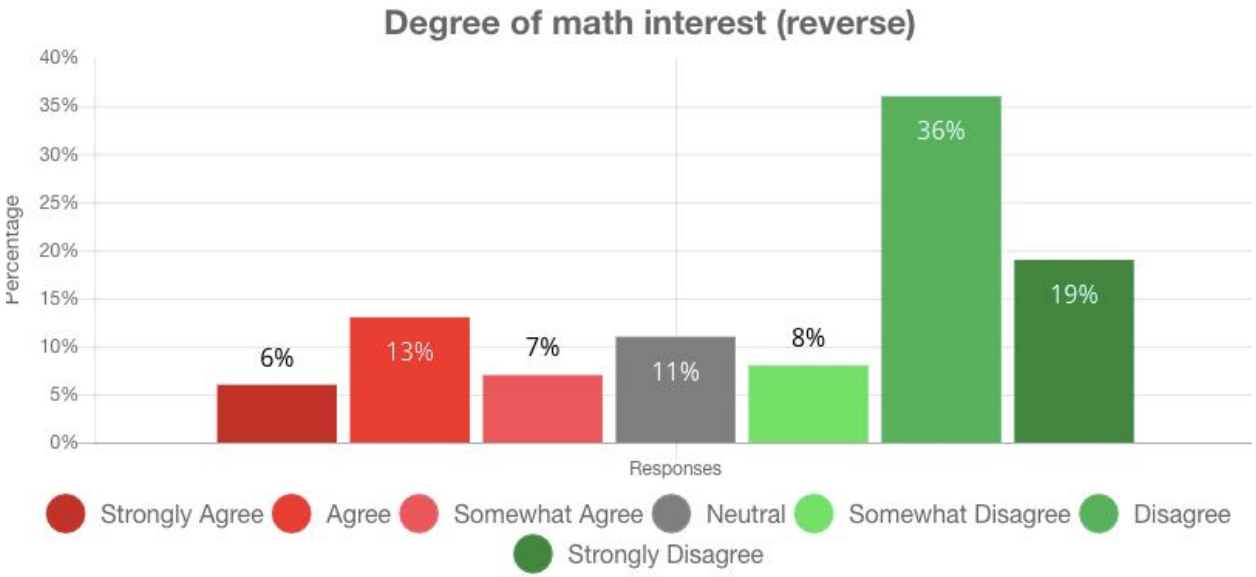


POST

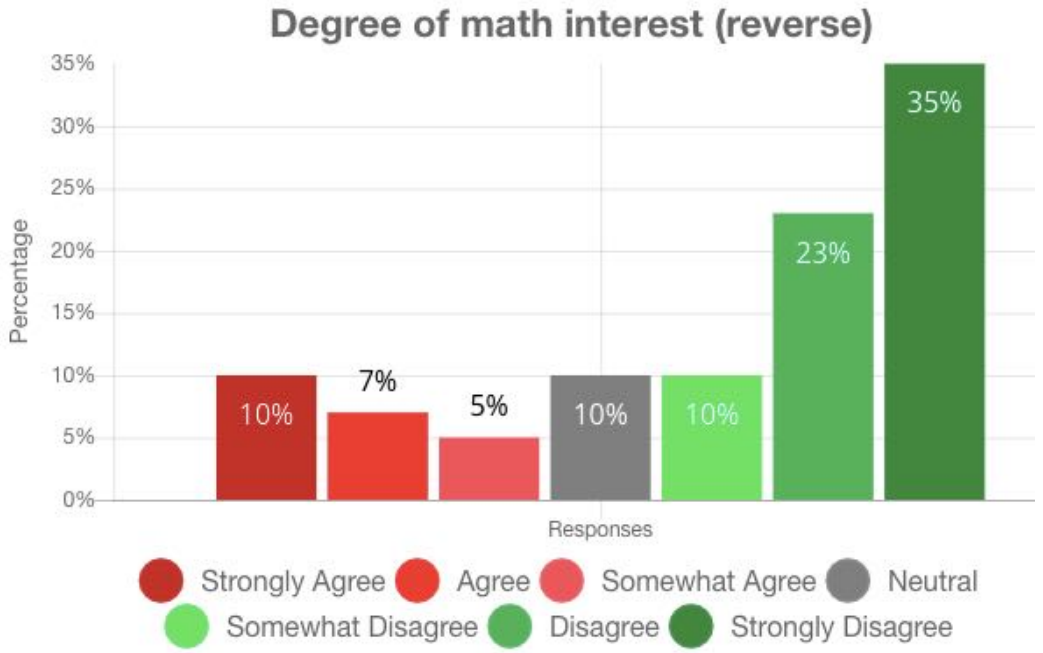
Positive indicators for attendees

Positive indicators for attendees

Modest gains



PRE



POST

‘What comes to mind when you think of the ‘brain’?’

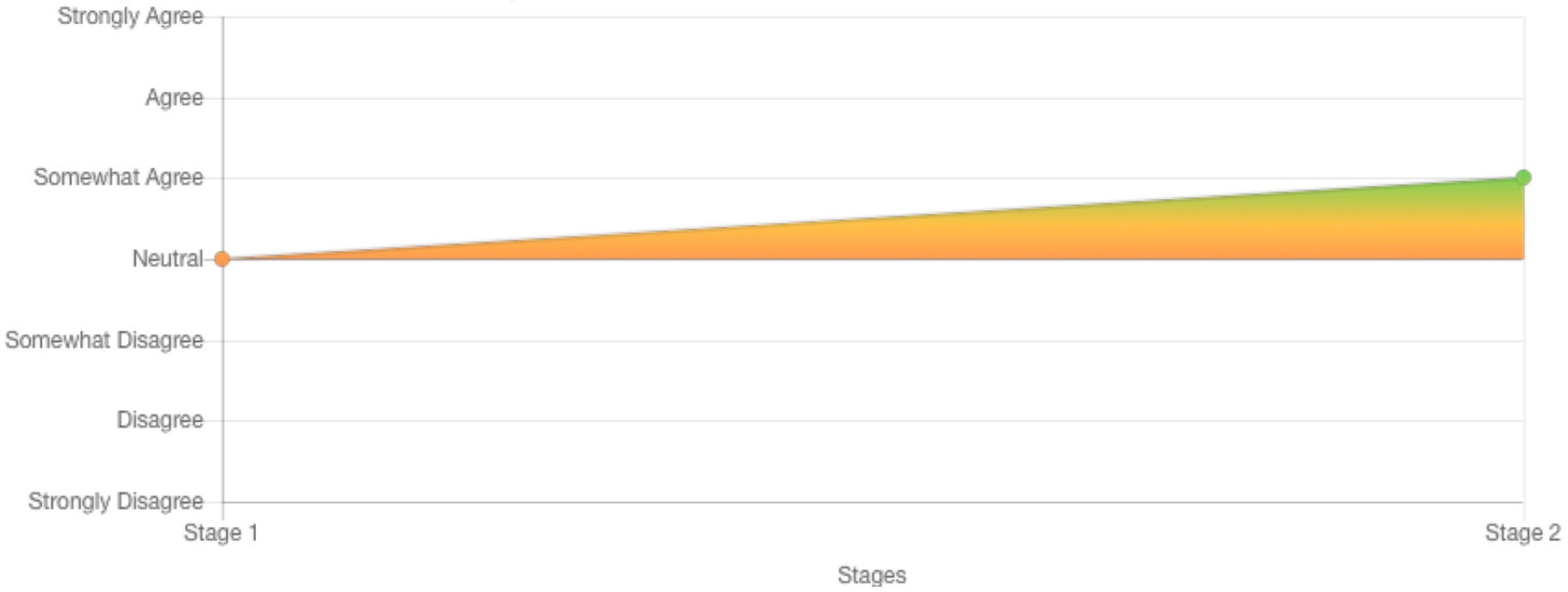
“Thinking. Creativity. Using the body.”

Pre-visit survey response

“Neural network - wonderful thinking machine - incredible networking - how the 2 sides operate i.e. left and right.”

Post- visit survey response

Individual level change



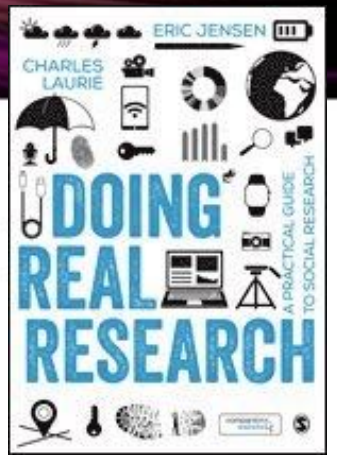
Chloe - "I feel capable of discussing neuroscience research with my friends"

Good Impact Evaluation

- Is **SYSTEMATIC**
- Tells you **how** and **why** particular **aspects** of activity are effective

Good Impact Evaluation

- A binary result ('good' / 'bad' or 'successful' / 'unsuccessful') doesn't help you learn



How will you measure success?

Get started on evaluation design

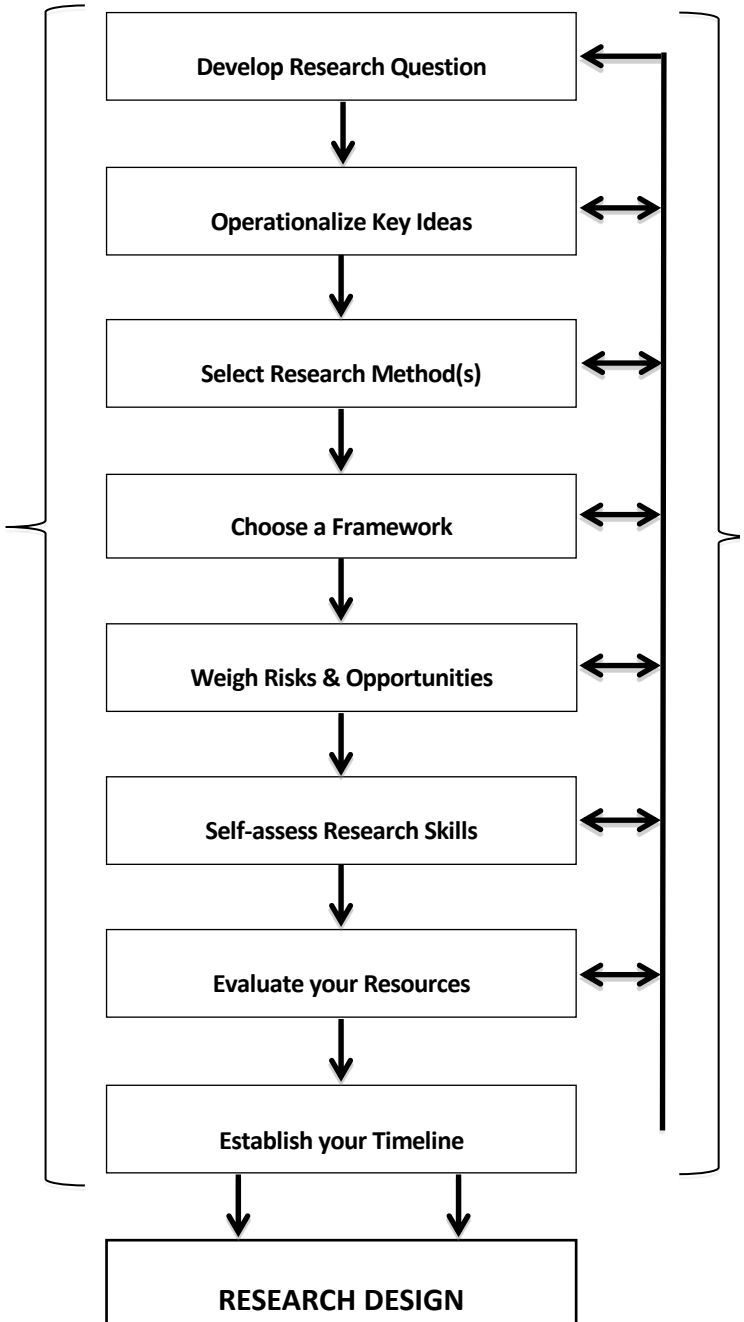
Evaluation design

- Your evaluation design is your road map to keep you on a feasible and appropriate path.
- It is the plan you develop to identify the methods and procedures you'll use throughout your evaluation project.
- It will help you anticipate and navigate risks and uncertainties that arise.

Get started on evaluation design

- You'll need to match the evaluation goals that motivate your project with methods for meeting those goals.
- Choose what kind of data to collect, from whom, in what setting and with which methods.

Figure 1.1 Developing your research design



Get started on evaluation design

- You are likely to need to adjust your evaluation design as you go along to:
  - Accommodate new information
  - Address obstacles to your initial plans
  - Re-think some of your assumptions.
- It is essential that you document and justify the decisions you make along the way: It's easy to forget!

Develop your evaluation focus (Discuss)

Consider the following points when crafting your evaluation focus:

- *What are you looking to find out?*
- *What information do you need to answer your question?*
- *Will it be feasible to gather the data required to answer your question in the time you have available?*
  - *If 'no', you probably need to narrow or change your focus.*

PracticalEvaluation.tips

PracticalEvaluation.tips

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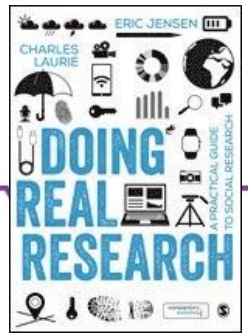
Arts & Humanities Research Council

WARWICK



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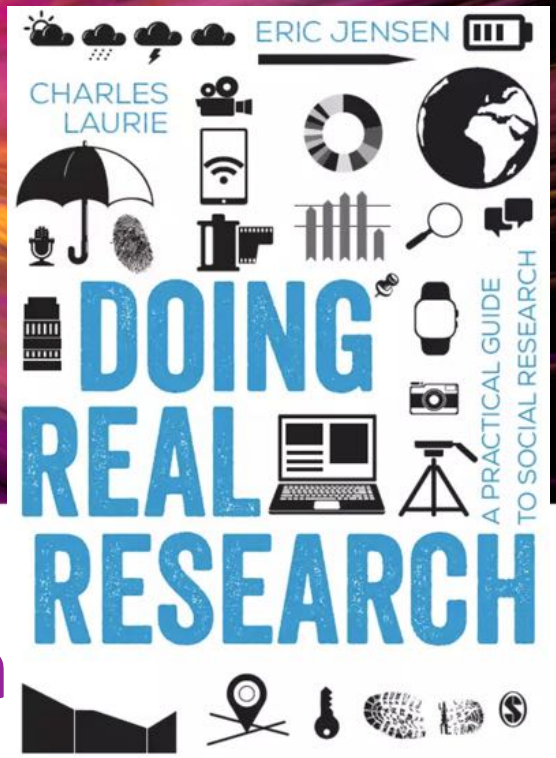

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