# Impact Oriented Interdisciplinary Research Programme

## Pre-Proposal Workshop

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*12 June 2019*

# Outline

- Background
- Introduction to Research Impact
- Impact Pathways
- Engagement with Stakeholders/Research End-Users
- Research Communication
- Summary

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# Key Issues

**Reduced Research Grants**

**Research Impact**

# Key Issues

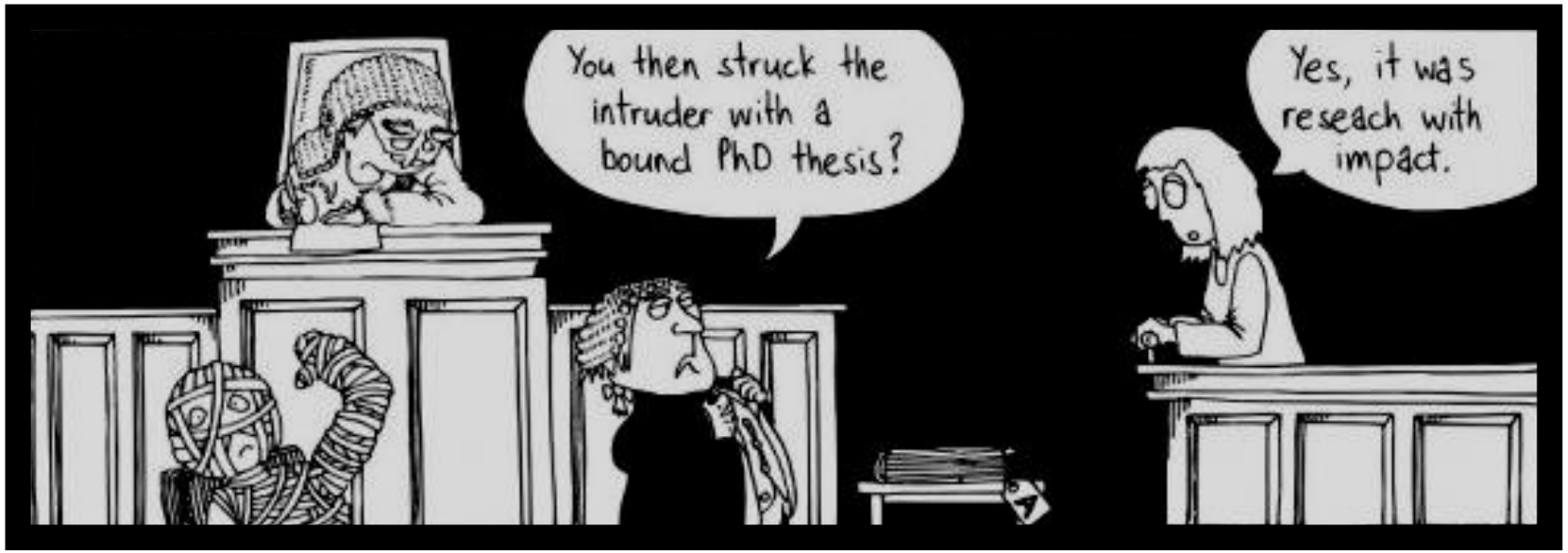
**Reduced Research Grants**

**Implication:** National grant applications become fiercely competitive

## Way Forward:

- Improve grant application success rate → improve proposal quality, increase number of proposals
- Target non-traditional national research grants, in addition to traditional national grants
- Industrial engagement
- International grants

# Research Impact ?



# Key Issues

**Research Impact**

*"an effect on, change, benefit to the **economy**, **society**, **culture**, **public policy** or **services**, **health**, the **environment** or **quality of life** beyond academia"*

http://www.atn.edu.au/eia/Docs/EIA_Trial_Guidelines_FINAL.pdf

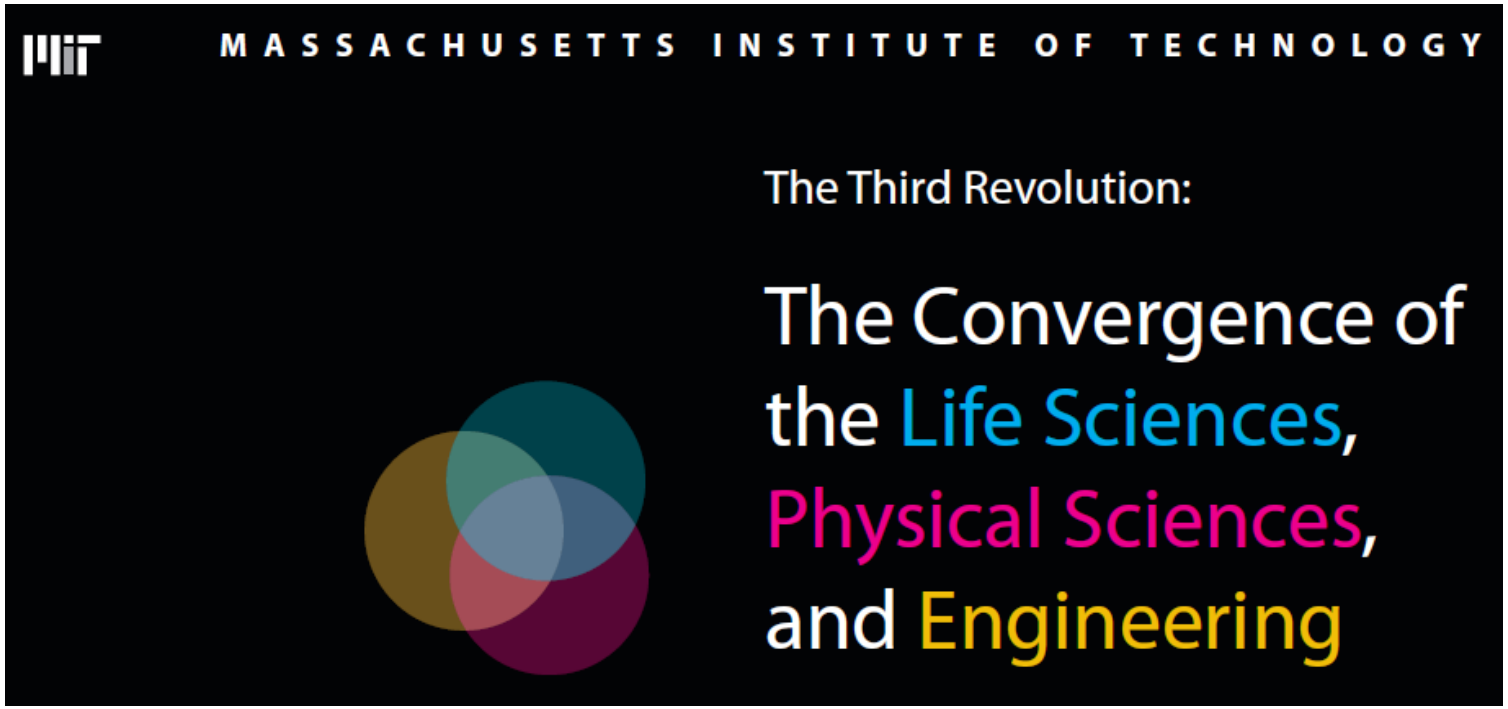
# On Going Global Trend

**Research Impact, interdisciplinary research, stakeholder engagement…**

- UK, Australia, EU, US
- UK Research Excellence Framework
- Excellence in Research for Australia (ERA)
- Horizon 2020
- **HIBAR** (**Highly Integrated Basic and Responsive Research**) are done by the Association of Public and Land-Grant Universities (APLU)
- Grand Challenges

## National Science Foundation (NSF), USA:

- Generating research question with potential societal impact is very important
- **NSF Office of Emerging Frontiers and Multidisciplinary Activities** initiated programs
  e.g., Germination of Research Ideas for Large Opportunities and Critical Societal Needs (Germination)
- NSF funded $ 5 mill research centre at the University of Missouri to advance research impact




*"We see convergence as a blueprint for innovation"*

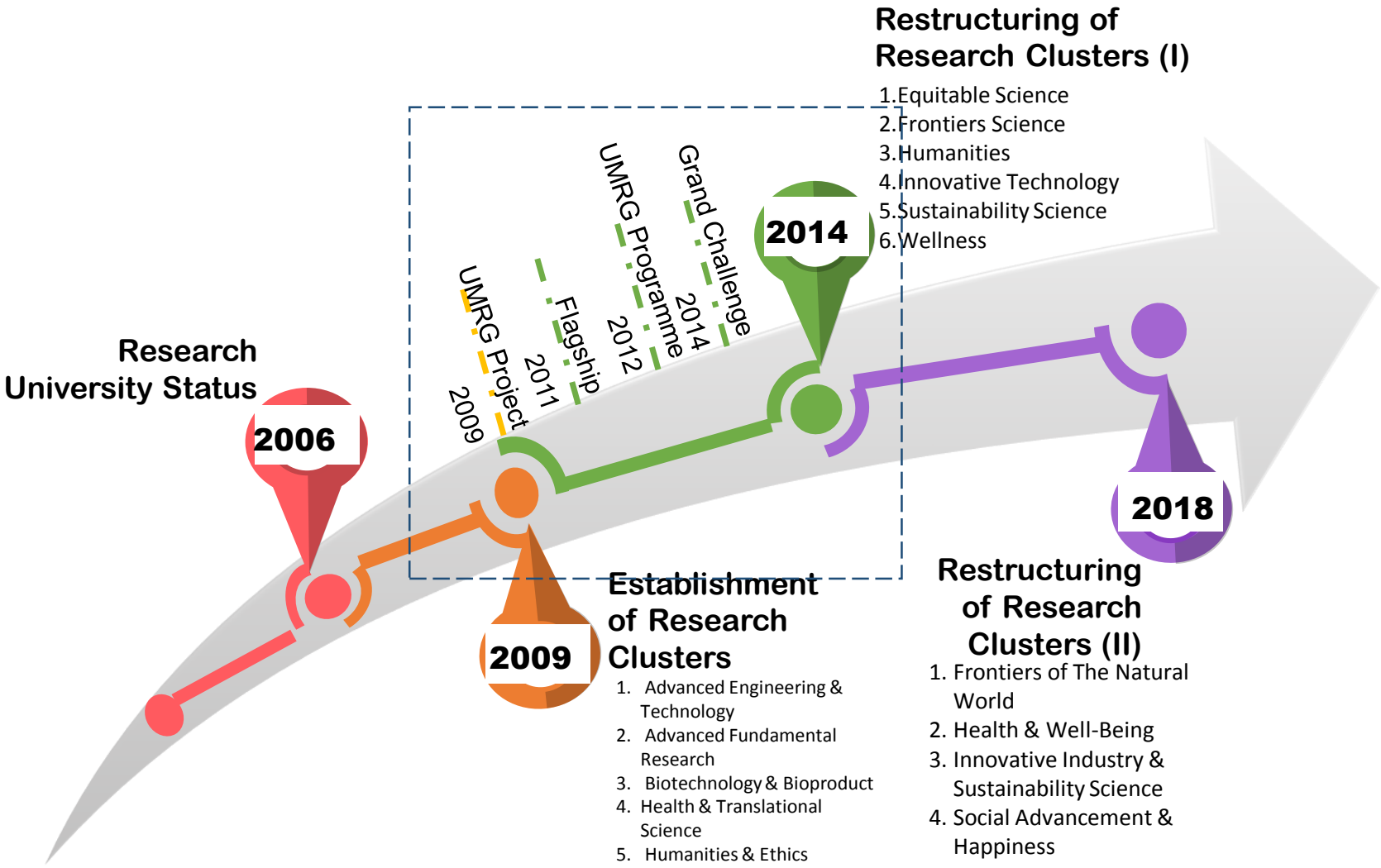
*"Convergence is a new paradigm that can yield critical advances in a broad array of sectors, from health care to energy, food, climate, and water."*

# Definition of Interdisciplinary Research as Adopted by NSF

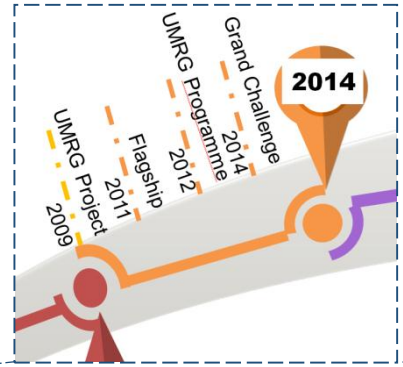
*Interdisciplinary research is a mode of research by teams or individuals that* ***integrates*** ***information, data, techniques, tools, perspectives, concepts, and/or theories from*** ***two or more disciplines or bodies of specialized knowledge*** *to advance fundamental understanding or to solve problems whose solutions are* ***beyond the scope of a single discipline*** *or area of research practice.**

*Committee on Facilitating Interdisciplinary Research, Committee on Science, Engineering, and Public Policy (2004). *Facilitating interdisciplinary research.* National Academies. Washington: National Academy Press, p.2.

# Research Cluster Evolution



# Evaluation of Research Programs

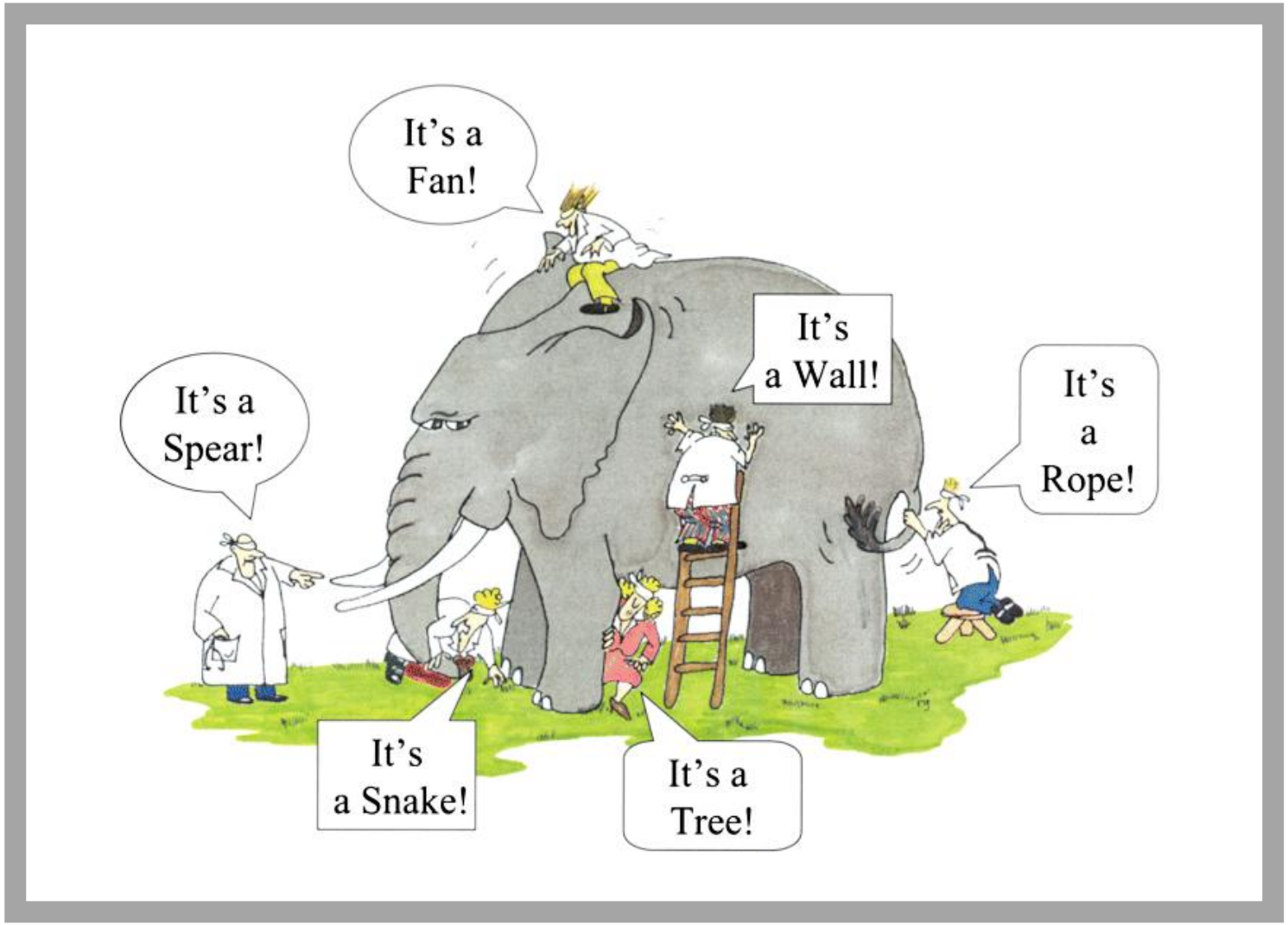



Individual Research Project ••• Research Programs ••• Grand Challenges (GC)

*Still researchers work in isolation in may cases*

*Useful learning experience*

# Talking about interdisciplinary research…

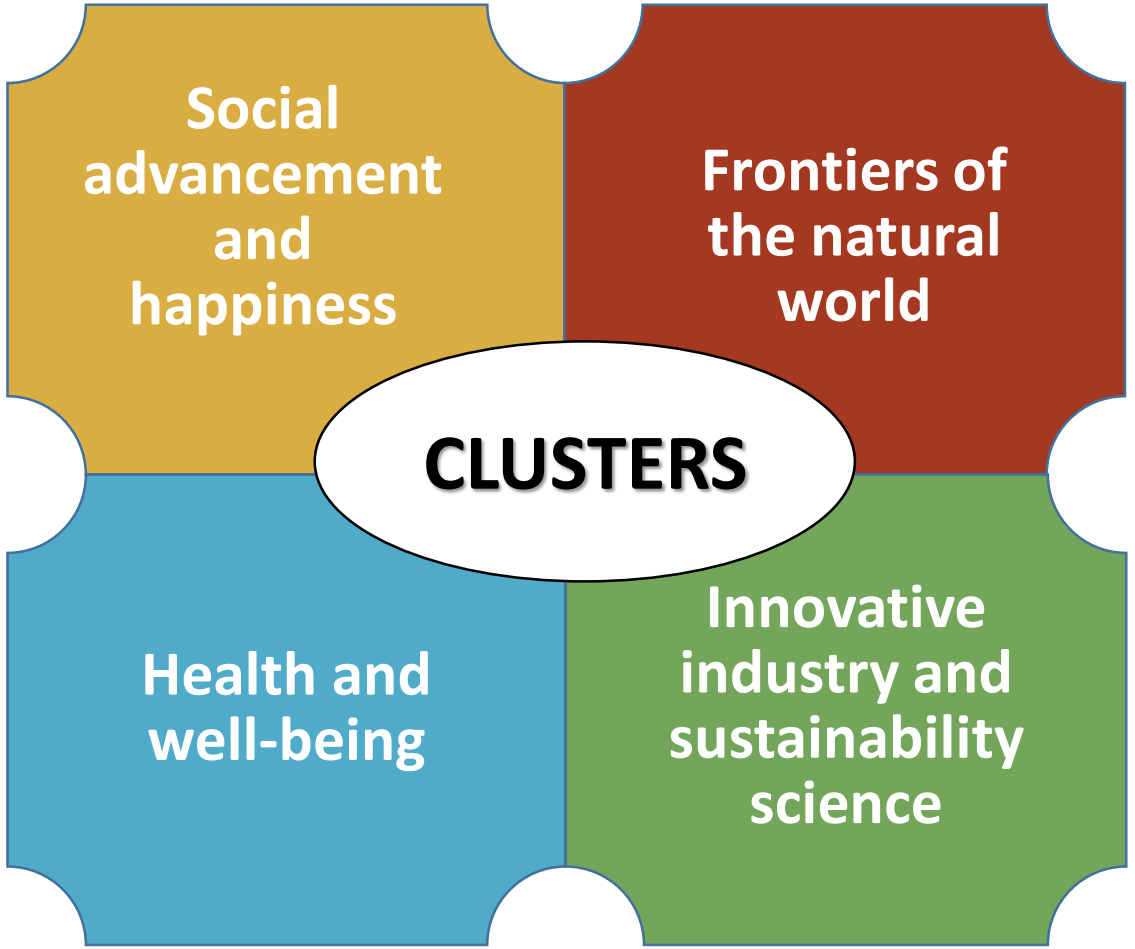




**Interdisciplinary research in many Research Programs !!!**

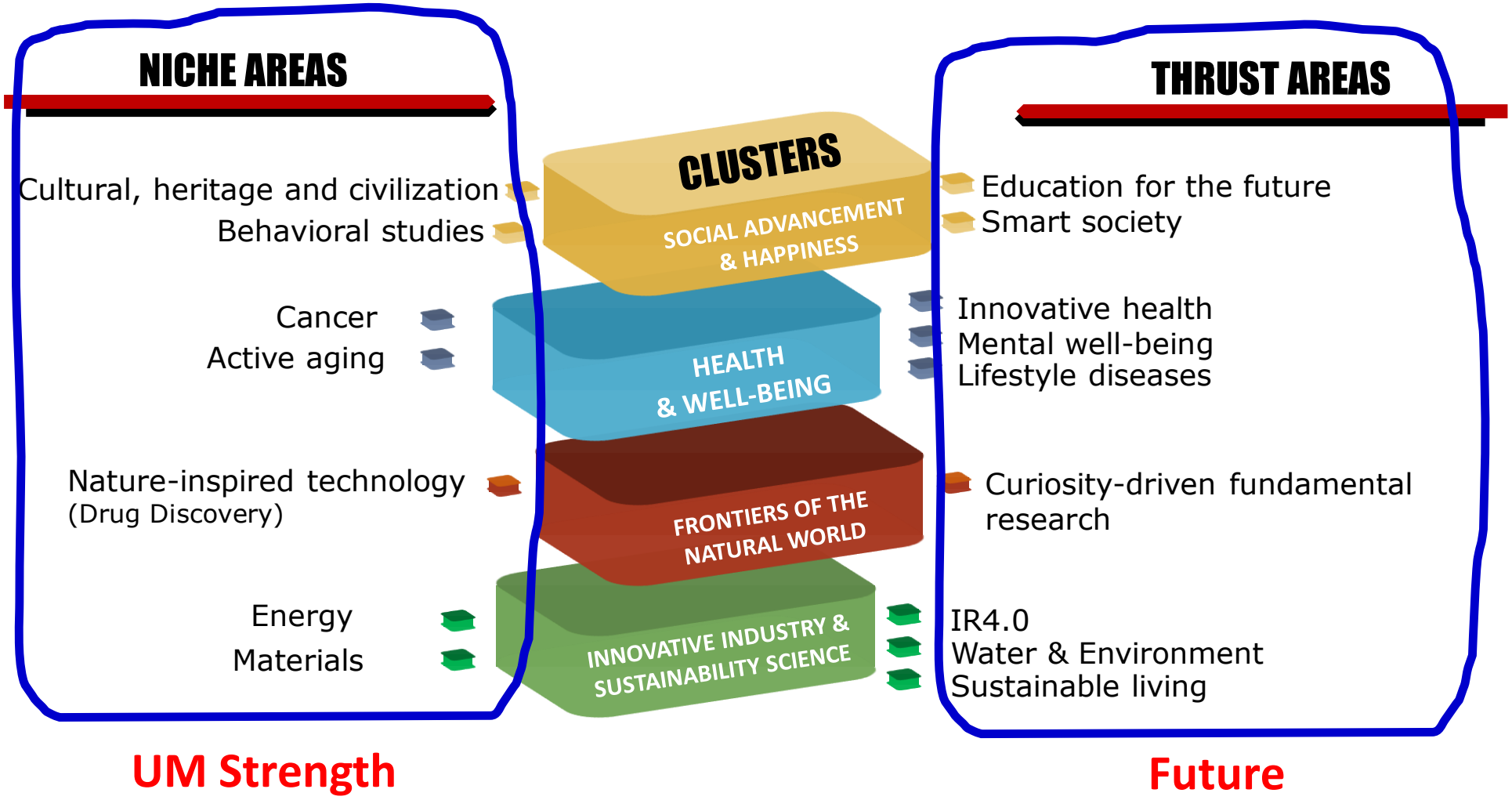
# Recent Re-structuring of Recent Clusters

*After analyses of data, series of workshops with faculties, research centres and meetings with management…*

Consolidation:
**4 Research Clusters**



# UM RESEARCH NICHE AND THRUST AREAS



# Niche Area and Thrust Area

## NICHE AREA

- *Specialised research areas with strong foundation already existing in the University*

Characteristics:-

- With strength (volume of research, visibility, recognised expertise)
- Critical mass (sustainability)
- Centre of research (as referral point, management) - preferred
- impact (social economy, academic)

## THRUST AREA

- *An area that the University would like to push*
- *An area of importance in the future*
- *Current thrust could be niche in the future*

Characteristics:-

- Emerging
- Potentially impactful research
- Innovative

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# Academic impact

"The demonstrable contribution that excellent research makes to academic advances, across and within disciplines, including significant advances in understanding, methods, theory and application".

*(Research Council UK)*

**Economic and societal impacts**

"The demonstrable contribution that excellent research makes to society and the economy."

*(Research Council UK)*

**Research impact**

'The contribution that research makes to the economy, society and environment beyond the contribution to academic research'

(*Australian Research Council, 2016*)

Economic and societal impacts embrace all the **extremely diverse** ways in which research-related knowledge and skills benefit individuals, organisations and nations

## Research impact is wide ranging

- Cultural impact
- Economic impact
- Environmental impact
- Social impact
- Impact on health and wellbeing
- Policy influence and change
- Legal impact
- Technological developments

## Society gains from research might include

- Better products/processes
- Better services
- Healthier lives
- Better welfare
- Increased understanding of ideas and attitudes, values and beliefs
- …
- …
- …
- and so on
-

# Examples of Impact

- Reducing Carbon emissions from cars
- Treating tumours without the need for surgery
- Influenced government policy on tax credits
- Changing army training programmes

# Why does impact matter?

- **Accountability:** Public money for the benefits of society
- **Quality:** Improvement of research by engaging with beneficiaries
- **Maximising benefits:** Shortening time to benefits
- **Reputation:** Enhancement of attractiveness for research and innovation

***Governments want to see a return on investments made in research***

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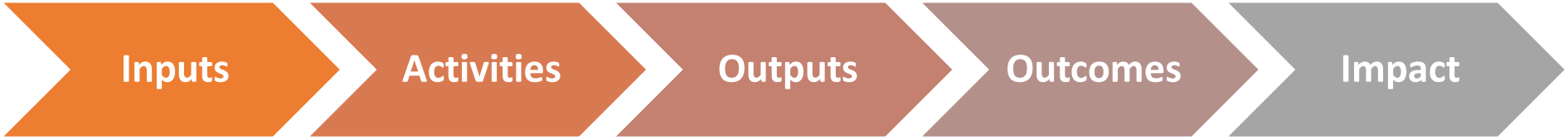
## Questions as useful starting point

- Likely outcomes of this research?
- Who will benefit from this research?
- How will they benefit from this research?
- How can you involve potential beneficiaries in this research?
- How will you know if it has made a difference?

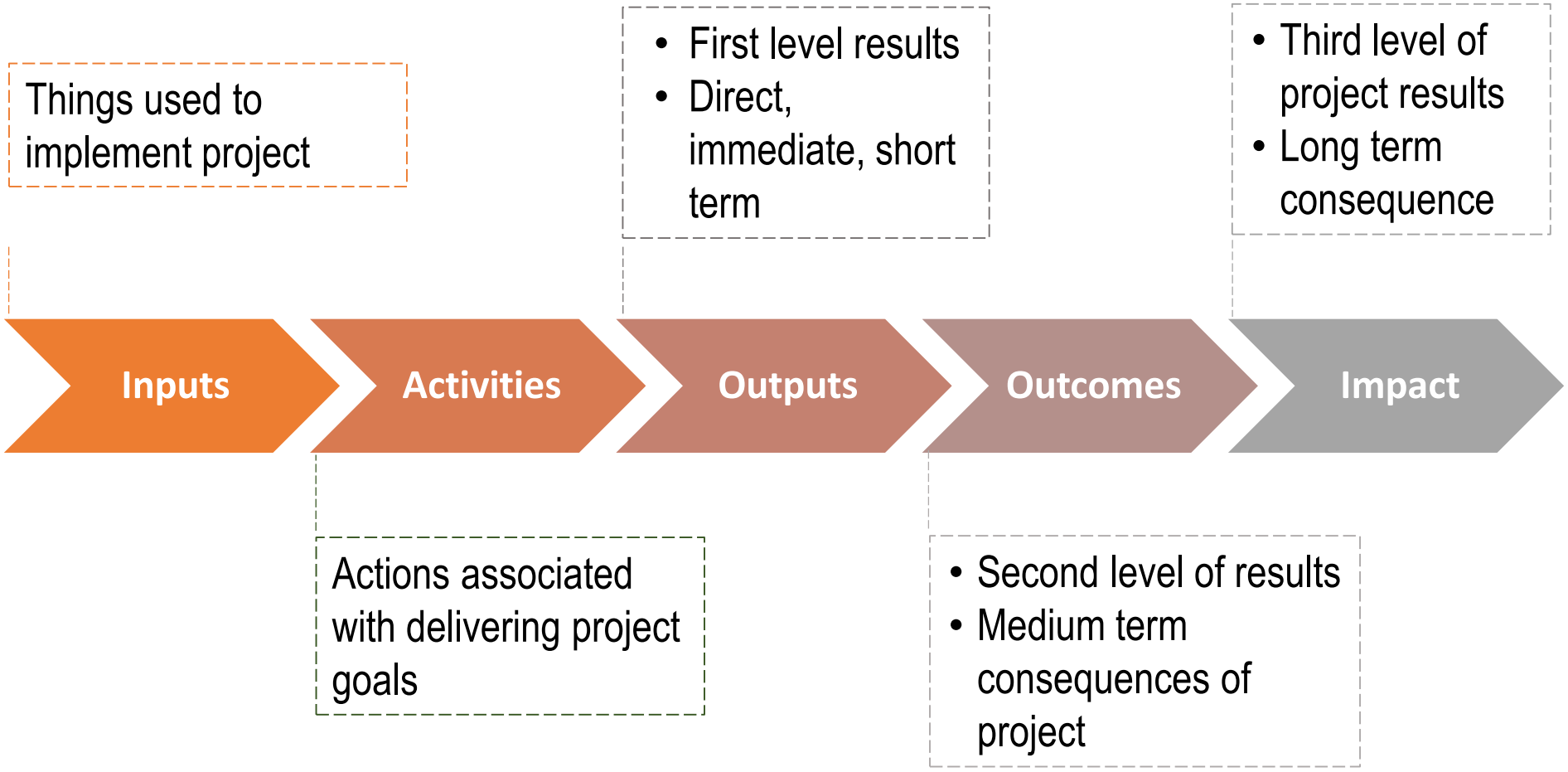
# The Results Chain: Linear Model



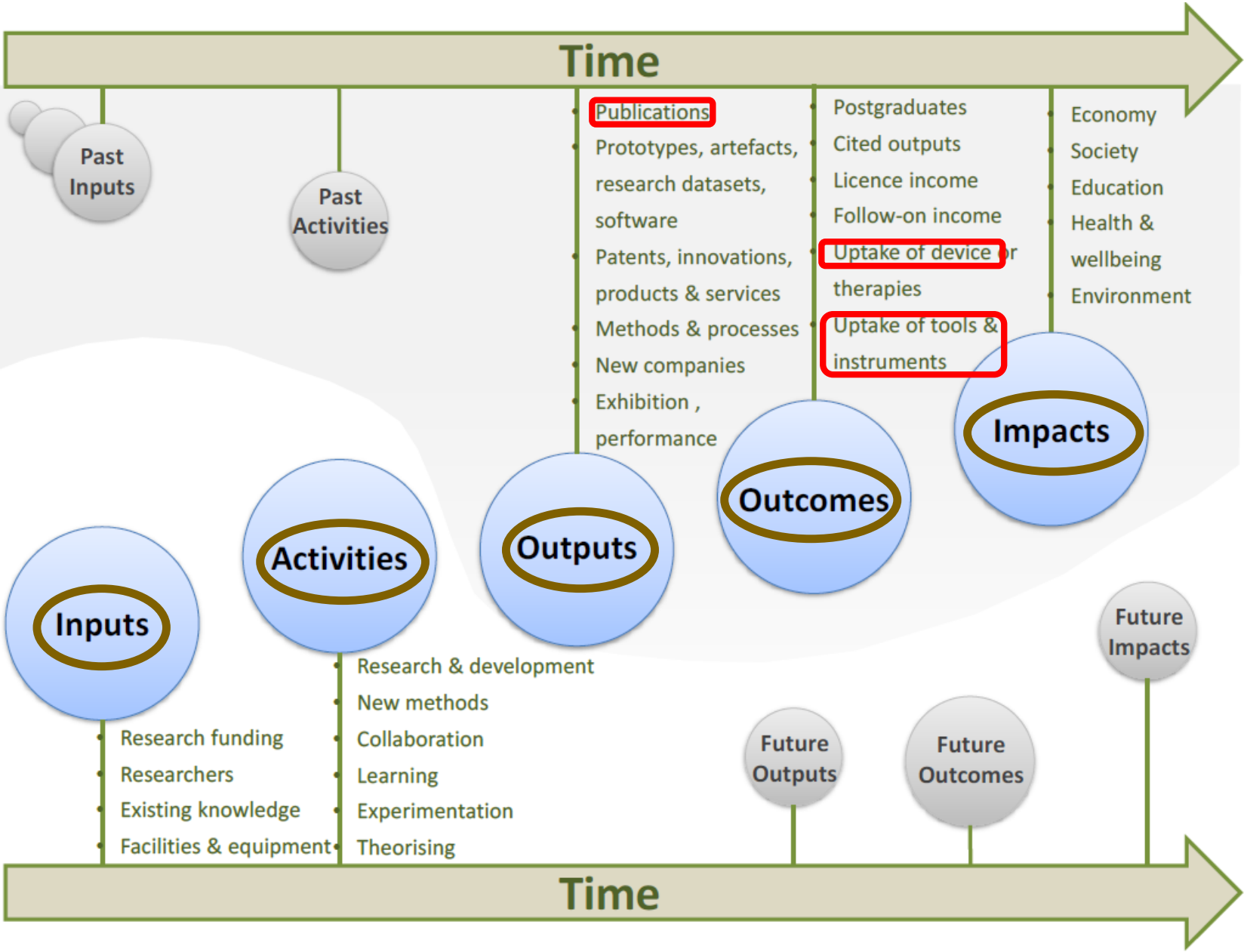

- **Varies across disciplines** – *is more or less tangible*
- **Takes time** – *but there may be intermediate outcomes on the way*
- **Evidence** – *need to monitor and collect evidence for every stage*



*Modified from: Young et al. (2014)*

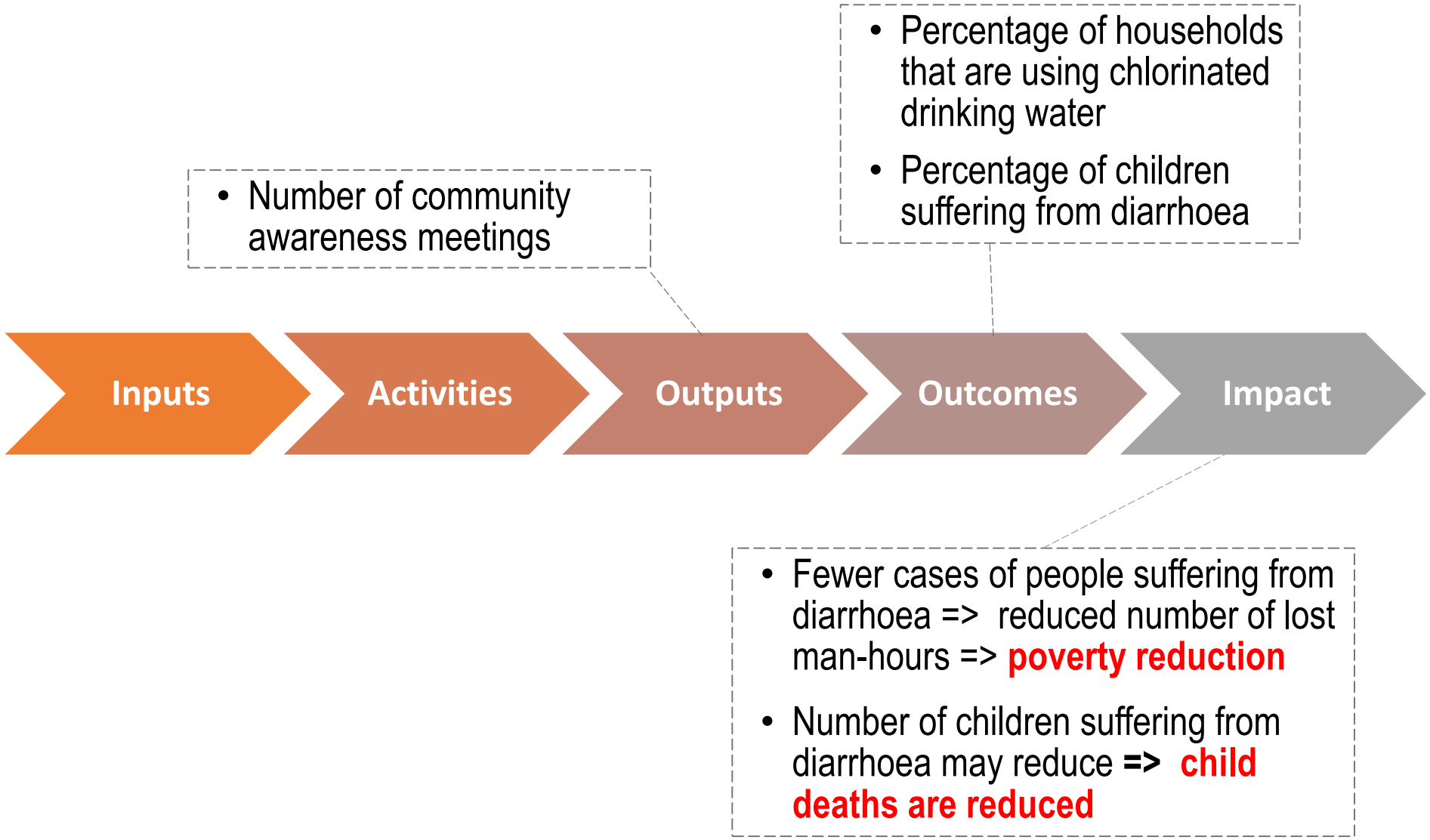

Things used to implement project
First level results
Direct, immediate, short term
Third level of project results
Long term consequence
Inputs
Activities
Outputs
Outcomes
Impact
Actions associated with delivering project goals
Second level of results
Medium term consequences of project

# Linkage of inputs, activities, outputs, outcomes & impacts over time




(*University College Dublin Report*)

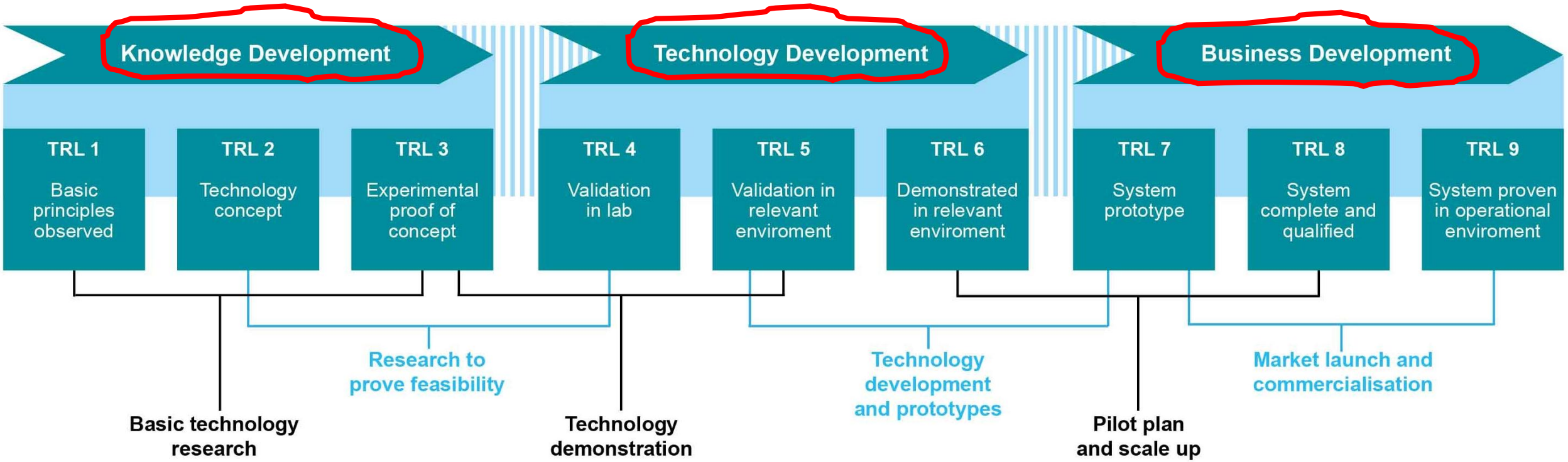
# Example: Safe Water Project



# Further Examples of Impact

- Wealth creation → spin-out company capitalisation, number of employees
- Environmental benefit → river now 10% cleaner than before
- Healthcare → 10,000 lives saved per year because of drug developed by research
- Social cohesion → policy developed in the research provides improved social networking among pensioners

# Development pathway for new technologies:
# Technology readiness levels (TRLs)



# Questions to Consider

- What stage of development is your technology at?
- Where do you hope to progress your technology to during your project? What is a successful outcome
- If your project is successful who is most appropriate funder to support next stage of development?
- Will your project deliver all the evidence and prior planning required to produce a high quality application for next stage funding?

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Impact relies on key partnerships and two-way communication with external stakeholders / research users

*“It’s very easy to sit in your lab and imagine your technology being useful, but it’s very difficult to actually ensure it is something useful.  I think the key to making that happen is better engagement.”*

Prof. David Erickson, Cornell University
INNOVOSOURCE
January 31, 2019

# ‘Innovation happens in cooperation’

*“The key is that innovation in universities now happens in cooperation with business, government agencies, public organisations and citizens and not in closed, linear systems.”*

Dr Thomas E Jørgensen
Senior Policy Coordinator, The European University Association (EUA)
University World News, 12 March 2019

***Research user:*** *A research user or beneficiary is an individual, community or organisation external to academia that will directly use or directly benefit from the output, outcome or result of the research.*

> *Examples of research users include governments, businesses, non-governmental organisations, communities and community organisations.*

***Stakeholder:*** *A stakeholder is anyone who is affected by or has an interest or stake in a particular issue.*

> *Examples of stakeholders include members of local, state, federal or tribal agencies; business leaders and industry representatives; representatives from non-profit groups or other citizen organizations; and individuals from loosely defined user groups, such as local residents or farmers etc.*

***All research users are stakeholders, but not all stakeholders are research users.***

# Research Engagement

- Interaction between researchers and research users for the mutually beneficial exchange of knowledge, technologies and methods, and resources in a context of partnership and reciprocity
- Research users: include industry, Government, nongovernmental organisations, communities and community organisations

**Outside of academia**

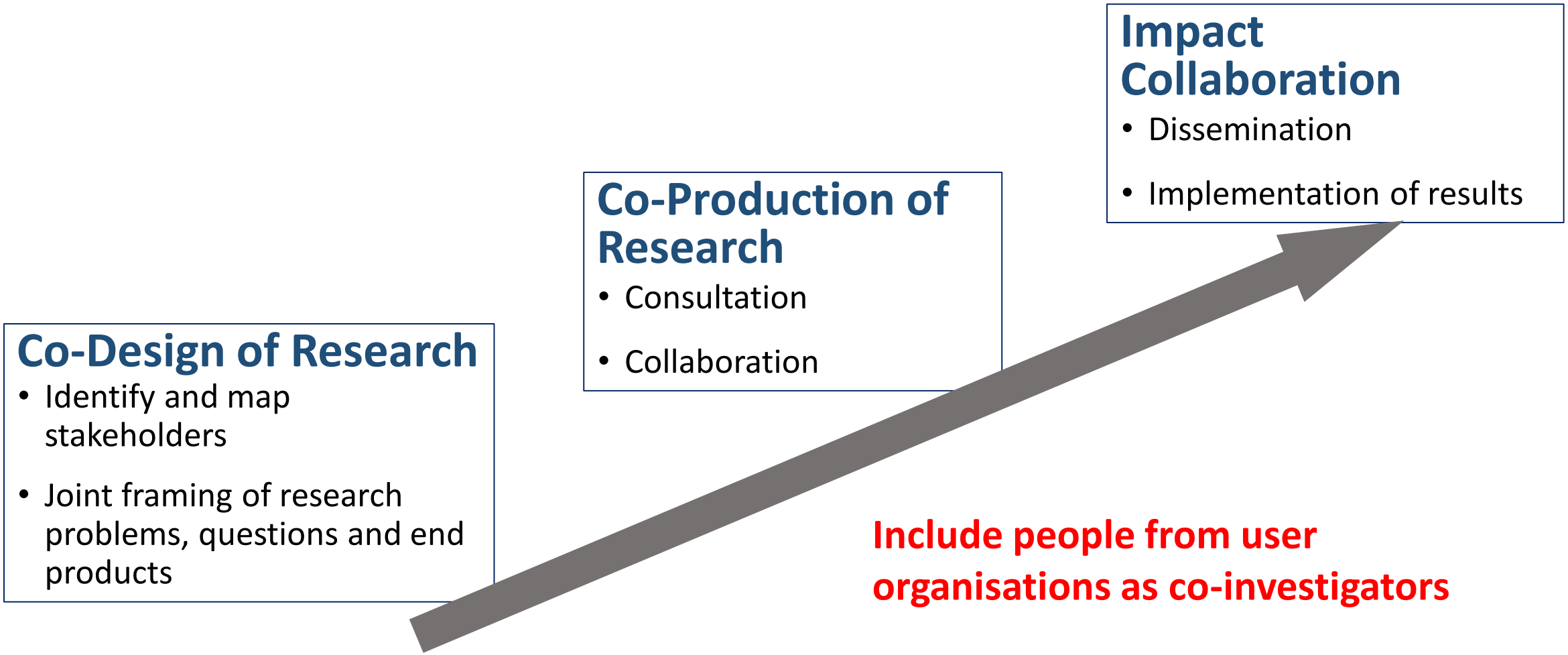
# Broad categories of research users may include

- General public/community/social enterprise groups
- Government and non-departmental public bodies (*ministers, civil servants, policy advisors/makers; regional, national, international*)
- Health care providers/agencies
- Charitable sector/NGOs Professional societies
- Private sector/industry (*large, small- and medium-sized enterprises [SMEs]*)
- Media partners (*collaboration with the media on feature stories, not press releases*)

- Engage with people outside academia → integrate best available knowledge on real life practices and get understanding on values, norms and preferences

- Joint framing of research problems, questions and co-production of knowledge among researchers and stakeholders

# Co-Creation of Research Project





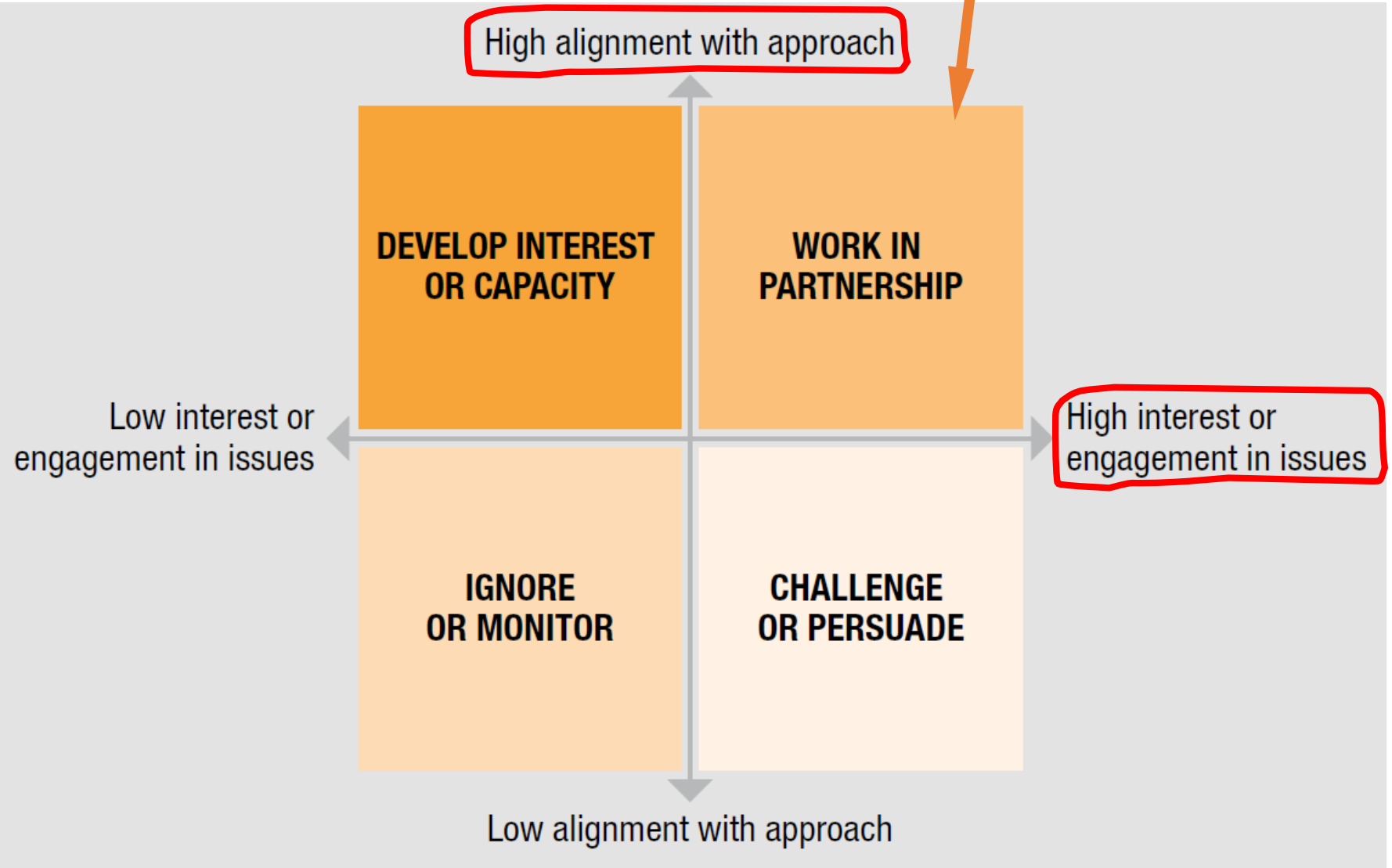

https://www.slideshare.net/DemosHelsinki/developping-a-transdisciplinary-research-project-a-case-study

# Engagement indicators

- Co-supervision of students by research end-users
- Co-authorship of research outputs with research end-users
- Co-funding of research outputs with research end-users
- Joint patents granted

- Citations in patents to traditional research outputs
- In-kind support from end-users
- Cash support from end-users
- Research income / commercialisation income

**Both interested in your issue and aligned with your approach**




## Stakeholder Intent and Influence Matrix (AIIM)

*Source: Young et al. (2014)*

## F. RESEARCH IMPACT[i]

| **You can use these columns to help write your 'IMPACT SUMMARY'** | | This may be helpful for structuring your **'Impact Summary'** and **'Pathways to Impact'** sections | **You can use these columns to help write your 'PATHWAYS TO IMPACT'** | | | | |
|---|---|---|---|---|---|---|---|
| **Who** will your research benefit? (non-academic beneficiaries) | **What** will be the benefits to them from your research? | **How** would you categorise this benefit/beneficiary? (E.g. public, industry, Policy?) | **How** are you going to share your research with them? (I.e. what is the specific activity?) | **When** are these activities going to take place? (Be as specific as possible) | **Who** from your research project is going to arrange and deliver this activity? | What **resources/ training** will you need for this activity? (Include in costs & justification of resources) | **How will you know** these activities have been successful? |
| | | | | | | | |

i. Source: Guidance on impact in RCUK applications: https://www.york.ac.uk/staff/research/research-impact/impact-in-grants/)

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## Research will only have real world impact if it reaches right people

- *who* you want to reach
- *what* you want to do
- *how* you want to reach them

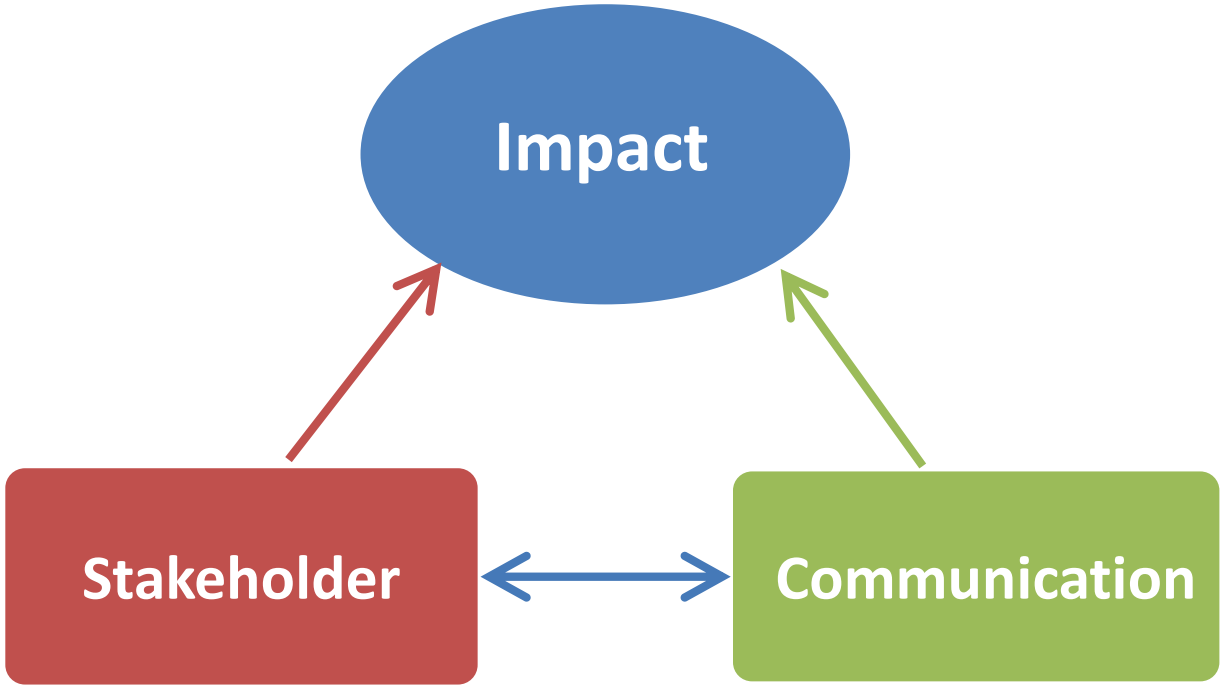
Think about channels and tools you will use and to what messages they will relate

- Multi-way exchange of knowledge between academia and research users in business, public and third sectors
- ‘Engagement’ not just dissemination
- Do not leave it to the end
- Communications in the broadest sense – both formal and informal

- Workshops
- Bi-lateral meetings
- Public events
- Policy dialogues
- Field visits
- Online networks

- Media/press release
- Website
- Radio, TV broadcast
- Blogs
- Social media
- Emails

- Digital engagement
- Data visualization
- Multimedia




Impact is achieved through effective communication and working closely with stakeholders

# Summary

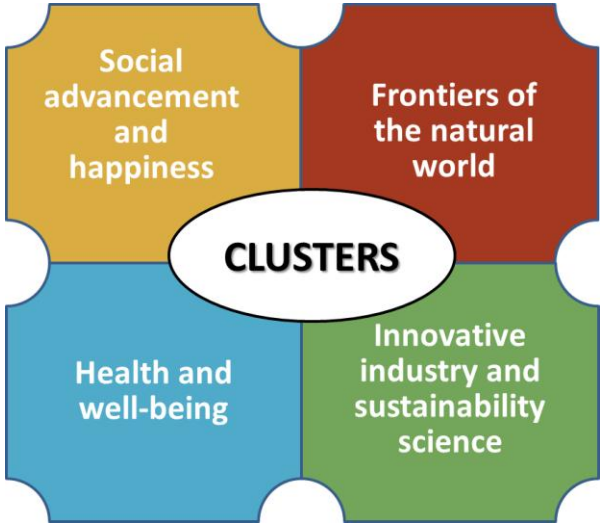
- Impact has to be built into project from the conceptual stage
- Research formulation together with industry/stakeholder
- Industry/stakeholders as research partners
- Demand/purpose driven research
- Expose researchers to impact pathways, innovation value chain, technology readiness level, path to commercialization

**Meaningful engagement with stakeholders right from beginning**
**+**
**interdisciplinary approach**

"*People cannot foresee the future well enough to predict what's going to develop from basic research.* ***If we only did applied research, we would still be making better spears.***"

George Smoot
Lawrence Berkeley National Laboratory
2006 Nobel Prize for Physics

# Thank you very much indeed !



# Extra

| Research Impact Pathway | | | | |
|---|---|---|---|---|
| **Inputs** | **Activities** | **Outputs** | **Outcomes** | **Benefits** |
| • Research income<br>• Staff<br>• Background IP<br>• Infrastructure<br>• Collections | • Research Work and Training<br>• Workshop/Conference Organising<br>• Facility Use<br>• Membership of Learned Societies and Academies<br>• Community and Stakeholder Engagement | • Publications including E-Publications<br>• Additions to National Collections<br>• New IP: Patents and Inventions<br>• Policy Briefings<br>• Media | • Commercial Products, Licences and Revenue<br>• New Companies – Spin offs, Start Ups or Joint Ventures<br>• Job Creation<br>• Implementation of Programs and Policy<br>• Citations<br>• Integration into Policy | • Economic, Health, Social, Cultural, Environmental, National Security, Quality of Life, Public Policy or Services<br>• Higher Quality Workforce<br>• Job Creation<br>• Risk Reduction in Decision Making |

# Disciplinarities: intra, cross, multi, inter, trans