UNIVERSITY OF MALAYA

Towards Achieving Research Impact

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OECD Reviews of Innovation Policy

MALAYSIA 2016

Some observations related to university

- 'Lack of demand-oriented research…'
- 'Lack of relevance of university R&D to industry…'
- 'Lack of cooperation with industry in general…'
- 'Malaysia also lacks platform or programmes that encourage interdisciplinarity and multi-perspective approaches…'

Recommendation related to university research

…

'…strengthen excellence and relevance of research with **enhanced potential for commercialization** and for **addressing societal challenges**…'

…

Outline

- Introduction to Research Impact
- Steps in Achieving Impact
- Engagement with Stakeholders/Research End-Users
- Research Communication
- Summary

On Going Global Trend

Research impact, interdisciplinary research, stakeholder engagement…

- National Science Foundation (NSF), USA:
  - Broader Impact: 1997,
  - 2010 *America COMPETES Reauthorization Act of Congress*
- UK Research Excellence Framework: 2014
- Excellence in Research for Australia (ERA): 2018
- EU Horizon 2020: 2014

- **HIBAR** (Highly Integrated Basic and Responsive Research) → Association of Public and Land-Grant Universities (APLU)
- Grand Challenges

National Science Foundation (NSF), USA:

- 'Broader Impact'
- 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

NSF, USA	**Intellectual Merit:** The potential to advance knowledge **Broader Impacts:** The potential to benefit society and contribute to the achievement of specific, desired societal outcomes
UK Research Council	**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. **Economic and societal impacts:** The demonstrable contribution that excellent research makes to society and the economy.
Australian Research Council	**Research impact:** The contribution that research makes to the economy, society and environment, beyond the contribution to academic research.

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IIRG is intended for → ***impact beyond academia***

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 get a return on investments made in research

Benefit for you as a researcher?

- Achieving impact can become a part of your track record as a researcher
- Benefit you directly by improving your status as a researcher
- Enhance your CV showing you as outward facing researcher with a wide influence beyond academia
- Help you to write stronger research grant proposals and more credible impact case study narratives
- Help you win funding or a new position / promotion

Motivation for your research

- **Intrinsic** or **value-driven** → interest or passion for the work or activity itself

  e.g., interest in mitigating climate change, improving public health or furthering the work of an influential writer.

- **Extrinsically driven motivation** → concerned more with outcomes and instrumental values

  e.g., securing funding, publishing in high quality journals or gaining a promotion

- **Leads to impact**
- **Long term**
- **May not be achieved in one project**

Your impact aims

Impact aims should be *specific* and *measurable* and not just reiterate the aims of your research project

Examples of impact aims:

- Improving the efficiency of electrical transmission
- Influencing decision makers to change local service provision
- Changing public behaviour/lifestyle choices to improve health

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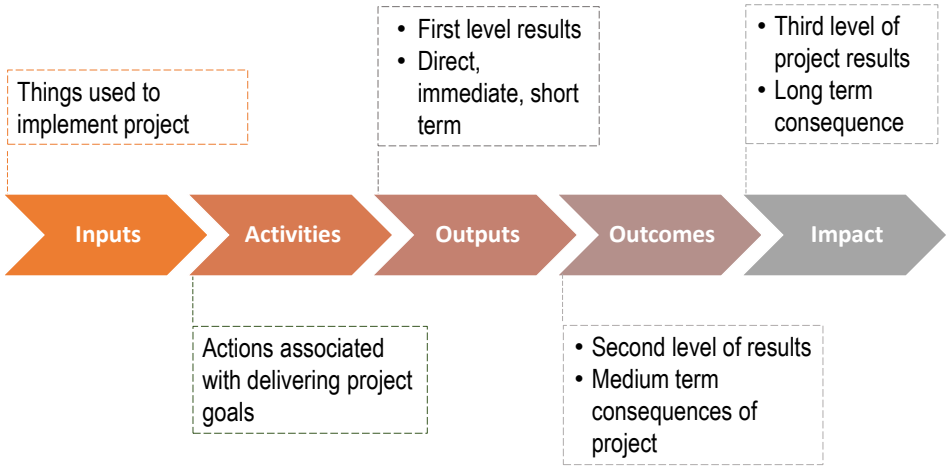
Questions as useful starting point

- 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**?

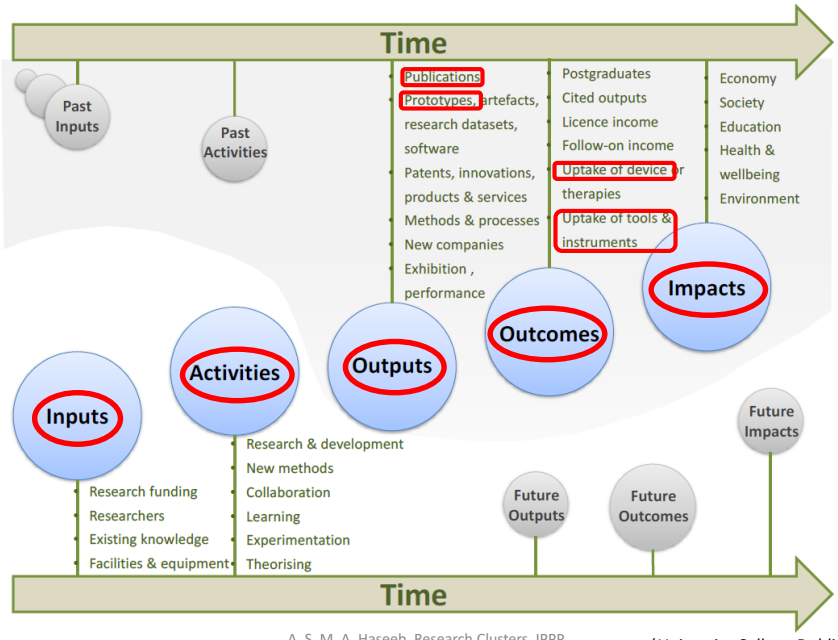
The Results Chain: Linear Model

- **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)

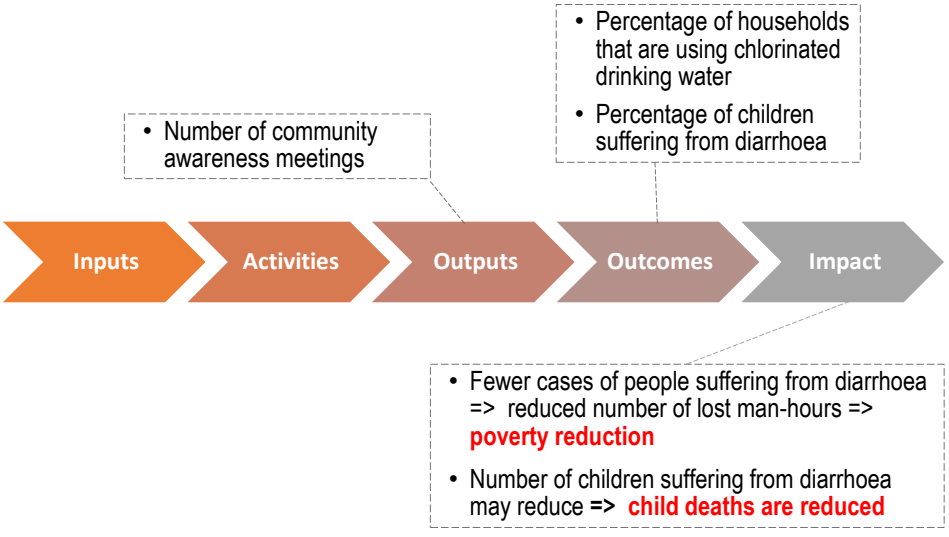


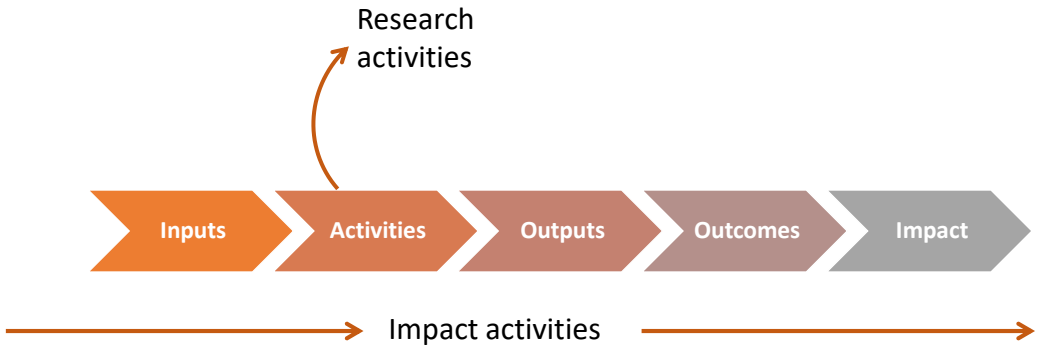
Linkage of inputs, activities, outputs, outcomes & impacts over time



(*University College Dublin Report*)

Example: Safe Water Project





Impact activities start even before the project and go beyond the project

Impacts can be manifested in a wide variety of ways

Impacts on

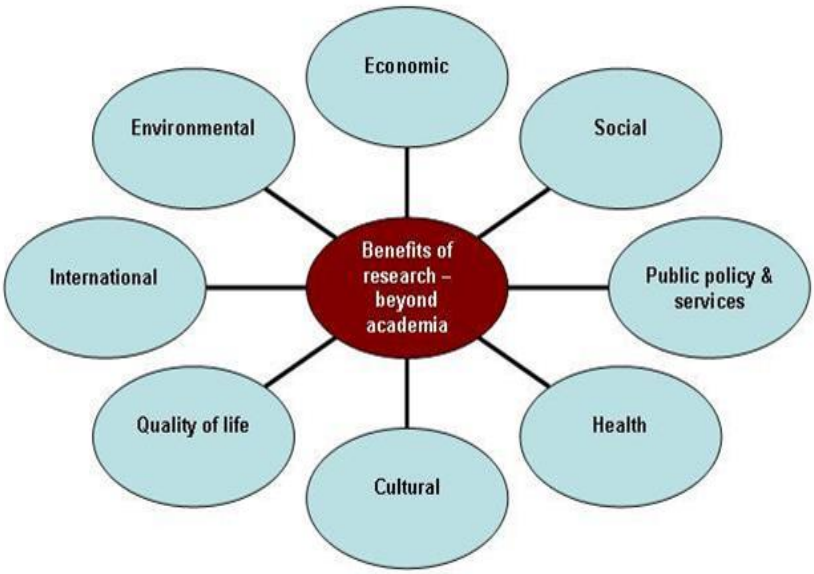
- Products
- Processes
- Practices
- Policies
- Behaviours
- Understanding
- avoidance of harm / waste of resources in widest sense

Impact of any type may be local, regional, national or international

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

The UK REF panels identified eight types of impact:



The UK REF panels identified eight types of impact:

Impact type 1 of 8: **Economic impacts**
Definition: Impacts that create jobs and revenue.
Example: Influencing changes to a business's processes to increase efficiency and profitability.

Impact type 2 of 8: **Societal impacts**
Definition: Impacts that change individuals', groups of individuals' or communities' attitudes, quality of life or creative practices, or that improve knowledge and appreciation of culture.
Example: Improving social welfare.

Impact type 3 of 8: **Policy and public service impacts**
Definition: Impacts that change the way decision makers work, such as changes in legislation, regulations, service provision or infrastructure investment.
Example: Contributing towards a change in government policy at a national or international level.

Impact type 4 of 8: **Health and wellbeing impacts**
Definition: Impacts that improve medical or social care provision.
Example: Improving treatment care for acute or chronic conditions.

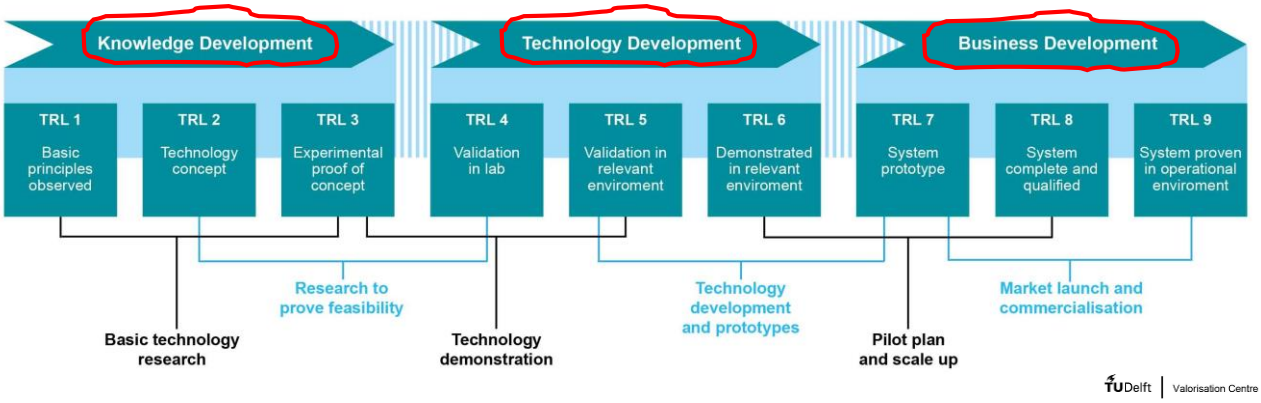
Impact type 5 of 8: **Environmental impacts**
Definition: Impacts that change resource use or the environment.
Example: Reducing negative impacts on the environment such as pollution.

Impact type 6 of 8: **Cultural impacts**
Definition: Impacts that change the public's appreciation of their own or other cultures, increase public engagement with cultural activities or otherwise enhance quality of life.
Example: Increasing public awareness of commissioned art.

Impact type 7 of 8: **Technological impacts**
Definition: Impacts that introduce, develop or utilise new and innovative technologies.
Example: Developing new computer software to improve learning.

Impact type 8 of 8: **Legal impacts**
Definition: Impacts that change primary or secondary legislation or regulatory frameworks.
Example: Contributing towards changes to existing laws.

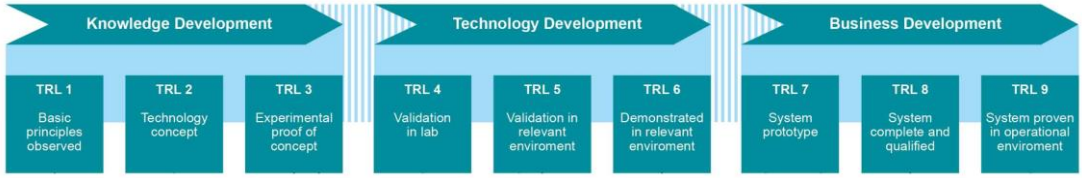
Development pathway for new technologies:
Technology readiness levels (TRLs)



TUDelft | Valorisation Centre

Questions to Consider

- What stage of development is your technology at?
- Where do you hope to progress your technology to during your project?
- 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

Key to making that happen is better engagement

"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."

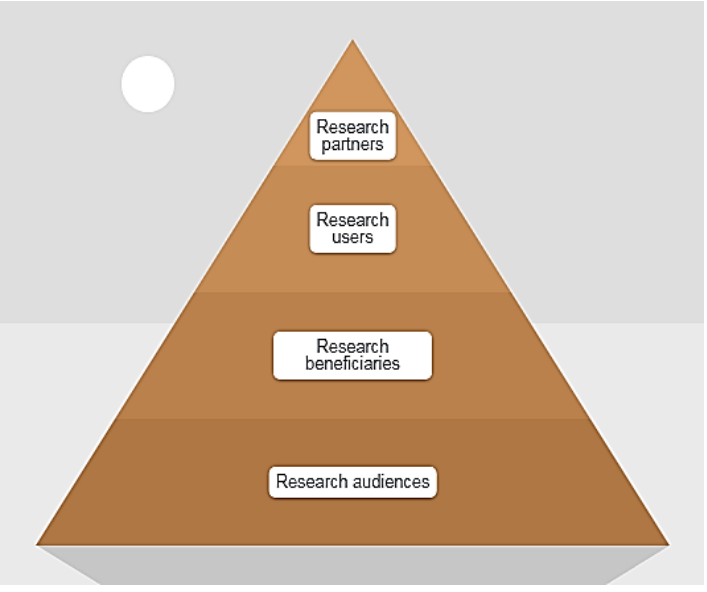
Dr Thomas E Jørgensen
Senior Policy Coordinator, The European University Association (EUA)
University World News, 12 March 2019

Researchers don't actually create impact beyond the academy by working alone

'Impact is measured as a function of our partners working with our researchers. Researchers don't actually create impact beyond the academy by working alone, they do that by working in collaboration with industry, who will make products, by collaborating with public sector organisations, who make public policy, or working with non-profit or community service organisations who are delivering social services.'

Dr. David Phipps, *Executive Director of Research and Innovation Services, York University, Canada*

Types of stakeholder



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.*

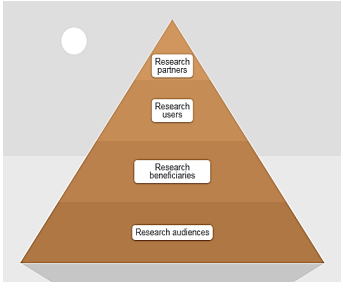
e.g., governments, businesses, non-governmental organisations, communities and community organisations.

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

e.g., 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.

Example: Research on IC chip development



Research Partner: MIMOS

Research User: Motorola

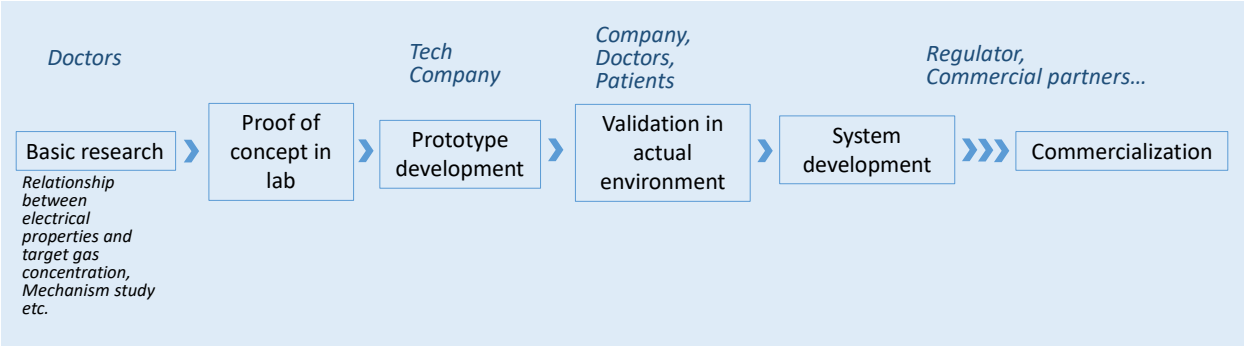
Research Audience:

- E&E industry in general
- Industry associations
- SMEs, suppliers, vendors etc.
- Ministries, agencies…
- Media
- General public

Another Example

Development of sensor for breath analysis

- Exhaled breath contains certain gases that are linked to certain disease, e.g., cancer
- Handheld, low cost device
- Screening of wide population → early detection
- Huge benefit in terms low healthcare cost, quality of life and wellbeing



Who is research user ?

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

Academics in other universities in and outside Malaysia
→not your stakeholder
→but research collaborators

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*)

To achieve your impact aims you will have to work with other people

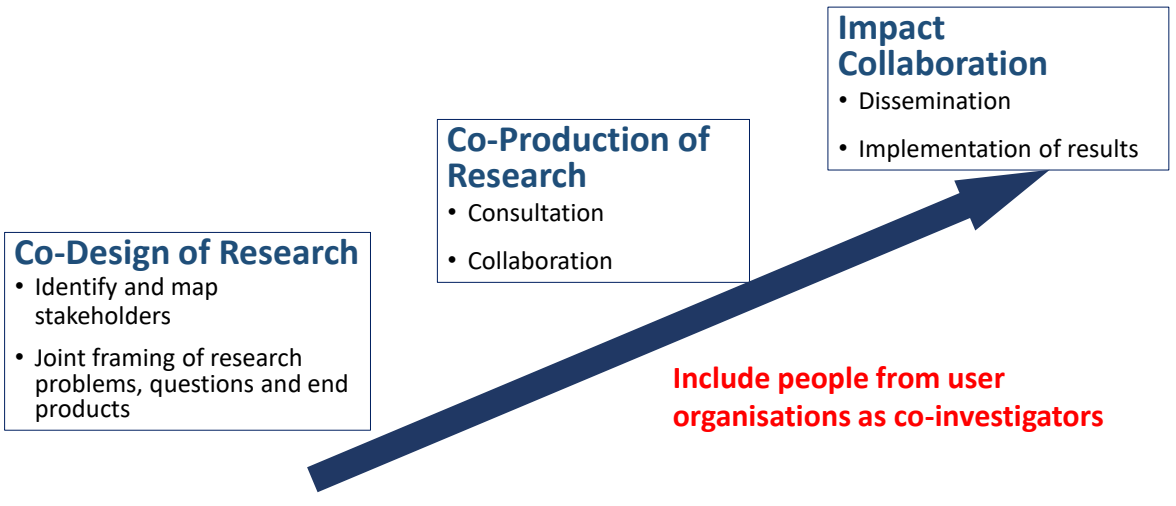
Examples might include:

- Working with companies to commercialise a product or technique
- Working alongside a specific MP to help influence a policy
- Holding a public meeting to raise awareness of the health impacts of lifestyle choices
- Publishing your research in a national newspaper
- Talking about your research on a local radio programme
- Securing the commitment of a local theatre
- Working with a museum to develop an exhibition to showcase your research
- Working with students to inform educational materials

Who will you need to work with to achieve your impact aims?

- 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

Some researchers tend to think that they would wait for research results before talking with stakeholders

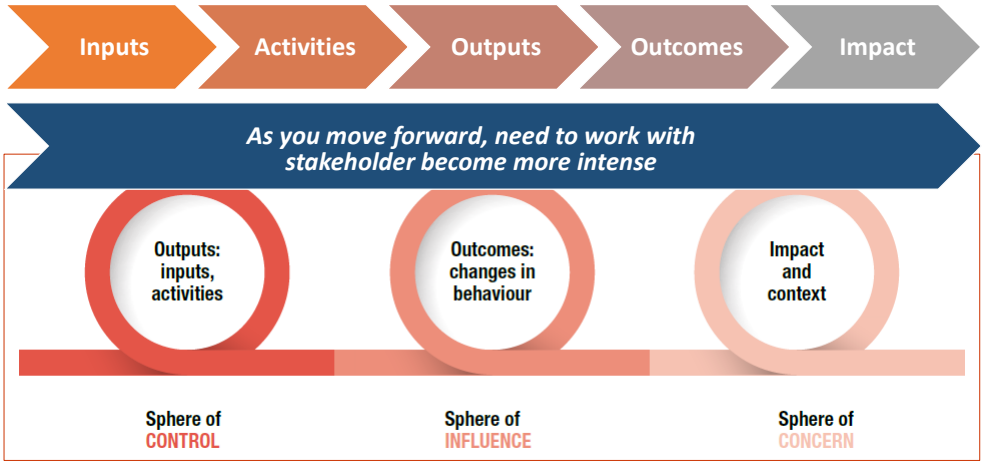
NOT A CORRECT APPROACH

Engagement indicators

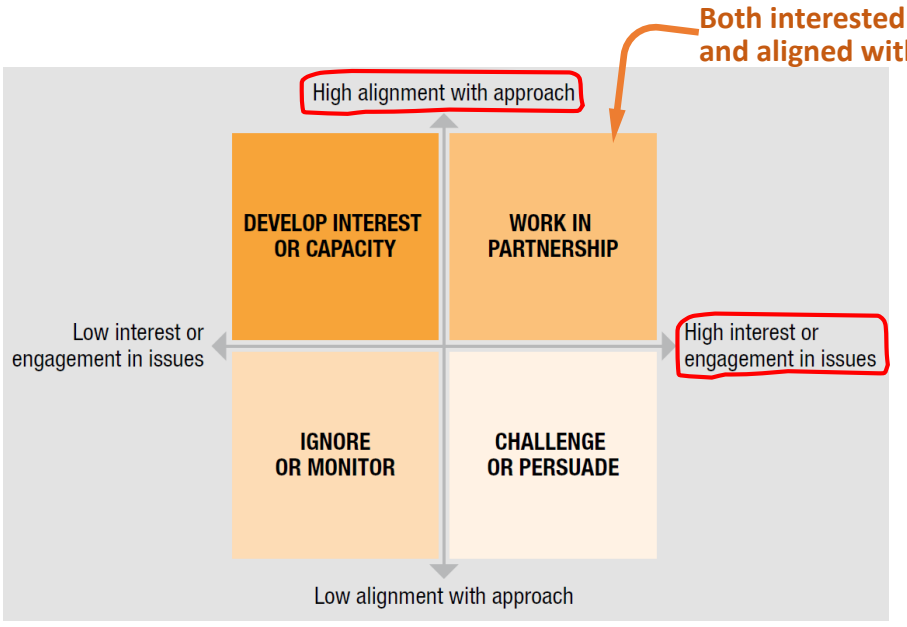
- Co-supervision of students by research end-users
- Co-authorship of research outputs with research end-users
- Co-funding of research outputs with research end-users
- Joint patents granted

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

Australian Research Council



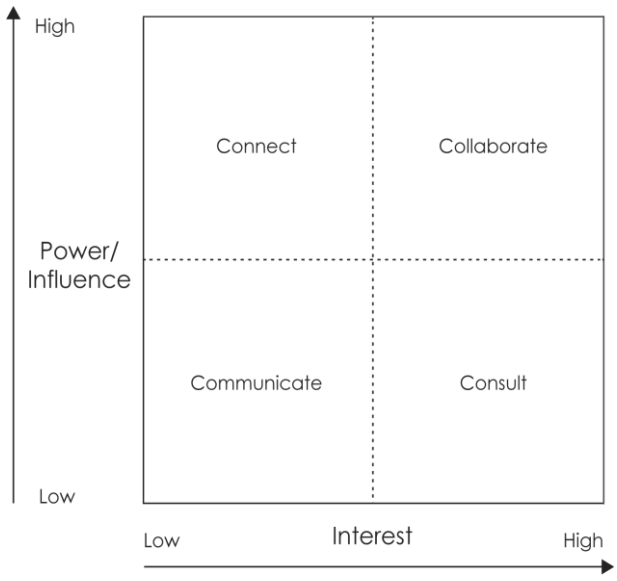
Framework showing spheres of control, influence and concern



Stakeholder Intent and Influence Matrix (AIIM)

Source: Young et al. (2014)

Power vs. interest grid



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/)

You need to do brainstorming in the whole group to come up specific answers to these questions

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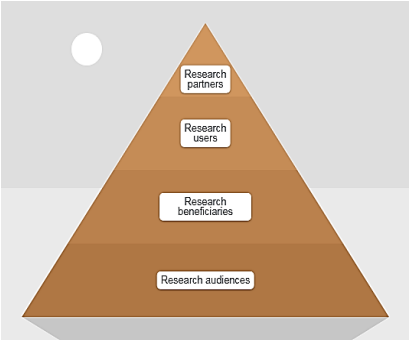
Research will only have real world impact if it reaches right people

- *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



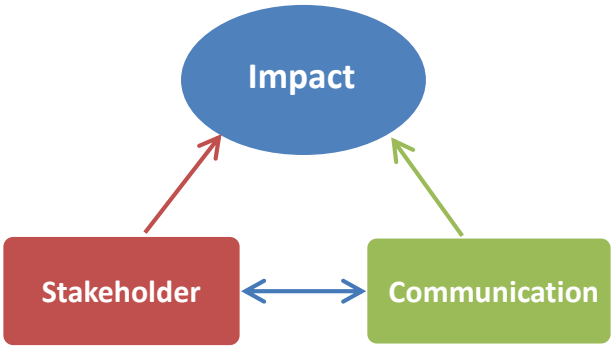
- ***Communication beyond academia → target research audience***
- ***Journal and conference papers are not research communication as far as impact is concerned***

- 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

Summary

- **Impact beyond academia is an inevitability** that academic researchers are increasingly going to face
- Researchers need to **deliberately aim at non-academic impact**, in addition to their traditional intellectual contributions
- Approach impact with a **long term carrier perspective**→ Impact is result of sustained and cumulative efforts in finding solution to problems that industry and society have genuine interest in
- **Researchers alone cannot achieve impact** → Need to engage effectively with relevant stakeholders to achieve it



Impact is achieved through effective communication and working closely with stakeholders

Possible steps in achieving impact

1. Set impact objectives
2. Identify stakeholders
3. Plan impact-related activities
4. Capture evidence of impact
5. Report impact
6. Maintain relationships

There is no one-size-fits-all approach to achieving impact from your research

- 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 research team to impact pathways, innovation value chain, technology readiness level, path to commercialization

Meaningful engagement with stakeholders from beginning

+

interdisciplinary approach

Identification of research problem to create impact

Traditional approach

- Research papers
- Conference papers
- Interactions with academic colleagues

Identify topic/problem of academic interest

Approach for achieving impact

Look at bigger picture
National needs, policies

e.g., In the context of energy research

- National renewable energy policy and action plan
- Building energy efficiency R&D roadmap
- e-Mobility technology roadmap
- Reimagining Malaysian electricity supply industry (MESI 2.0)
- Peninsular Malaysia Electric Supply Outlook
- Natural Gas Industry Annual Review

Talk with stakeholders, industry

Identify an unmet need where you, together with interdisciplinary colleagues can contribute

Consult research literature

Identify topic/problem which is academically challenging and has societal benefit

"*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 !