



Towards Achieving Research Impact

IIRG 2020 Briefing Session

A. S. M. A. Haseeb Research Clusters, IPPP University of Malaya 02 July 2020

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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**...'

...

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Outline

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

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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

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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

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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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NSF, USA

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Research impact: The contribution that research makes to the economy, society and environment, beyond the contribution to academic research.

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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
- •

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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

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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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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

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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

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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?

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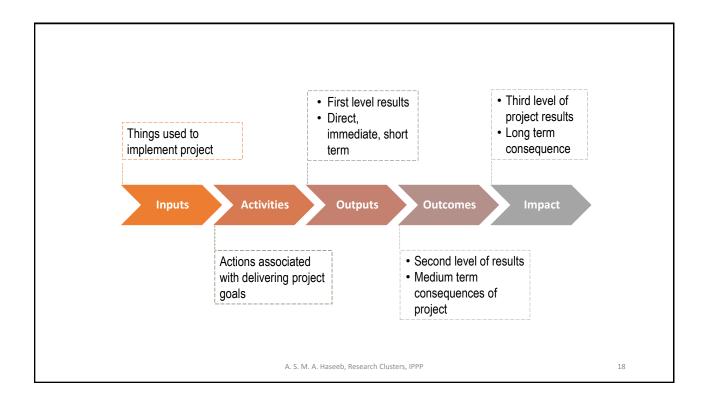
The Results Chain: Linear Model

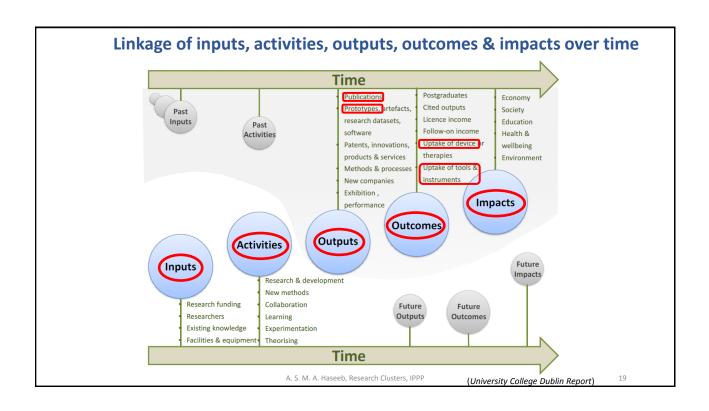
Inputs Activities Outputs Outcomes Impact

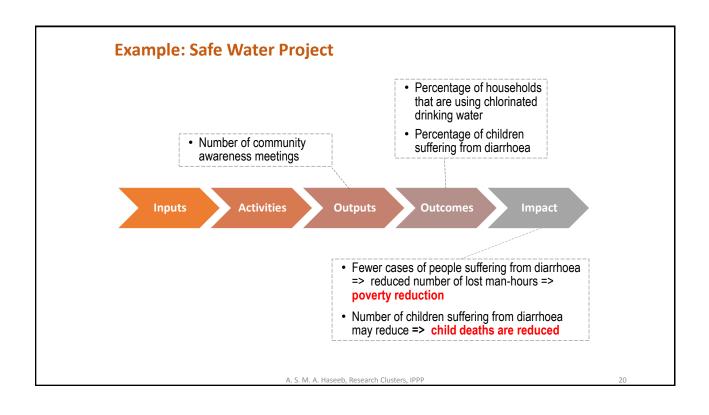
- Varies across disciplines is more or less tangible
- Takes time but there may be intermediate outcomes on the way
- Evidence need to monitor and collect evidence for every stage

Modified from: Young et al. (2014)

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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

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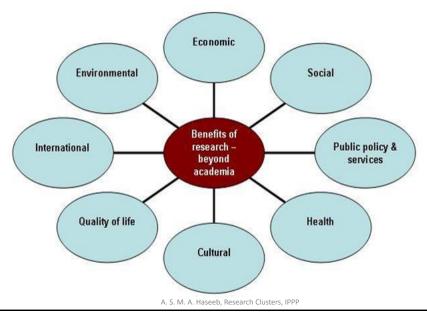
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Further Examples of Impact

- Wealth creation → spin-out company capitalisation, number of employees
- Environmental benefit → river now 10% cleaner than before
- Healthcare \rightarrow 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

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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.

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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.

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Development pathway for new technologies: **Technology readiness levels (TRLs)** Knowledge Development Technology Development **Business Development** TRL 1 TRL 2 TRL 3 TRI 4 TRL 5 TRL 6 TRL 7 TRL 8 TRL 9 Demonstrated in relevant enviroment System mplete and qualified Validation in lab Validation in Basic System prototype Technology Research to Market launch and prove feasibility development commercialisation and prototypes Technology Pilot plan Basic technology demonstration and scale up TuDelft | Valorisation Centre A. S. M. A. Haseeb, Research Clusters, IPPP

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

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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

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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

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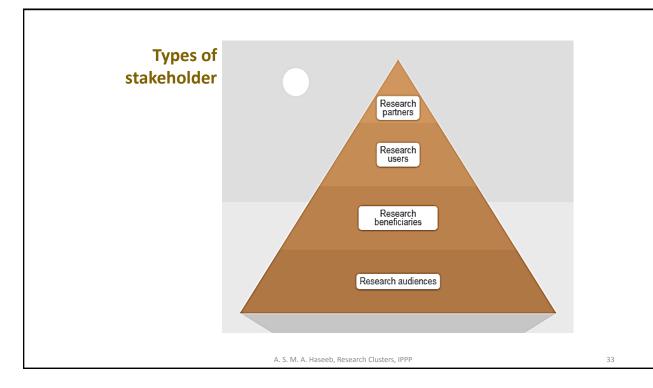
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Researchers don't actually create impact beyond the academy by working alone

'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

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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.

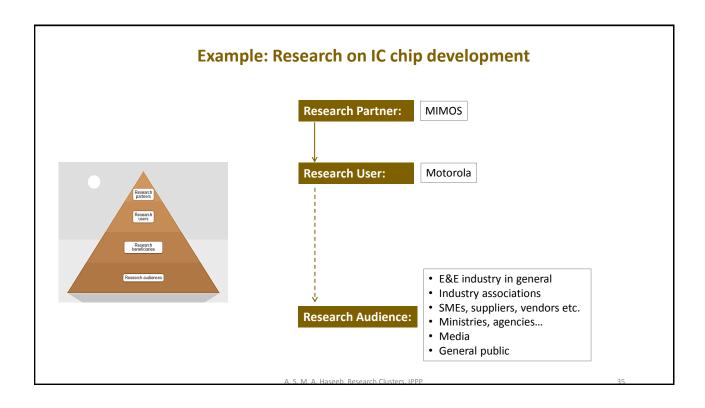
 $\it e.g., governments, businesses, non-governmental organisations, communities and community organisations.$

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.

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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

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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)

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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?

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- 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

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Co-Creation of Research Project **Impact** Collaboration Dissemination **Co-Production of** • Implementation of results Research Consultation **Co-Design of Research** Collaboration Identify and map stakeholders Joint framing of research Include people from user problems, questions and end products organisations as co-investigators

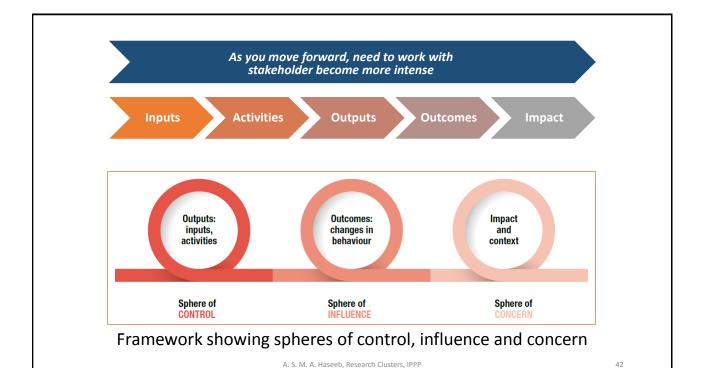
Engagement indicators

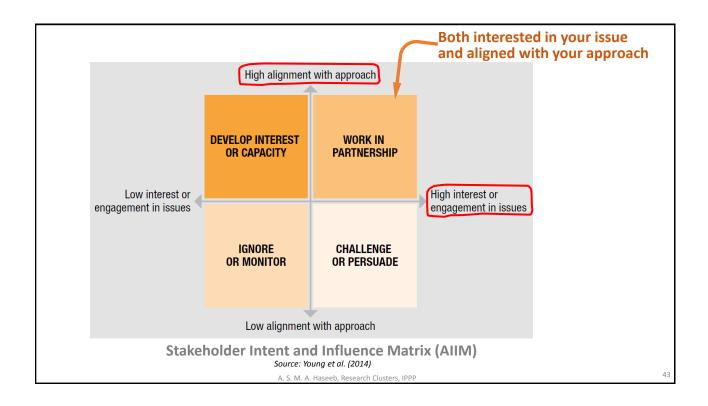
- Co-supervision of students by research end-users
- Co-authorship of research outputs with research end-users
- Co-funding of research outputs with research end-users
- Joint patents granted
- Citations in patents to traditional research outputs
- In-kind support from end-users
- Cash support from end-users
- Research income / commercialisation income

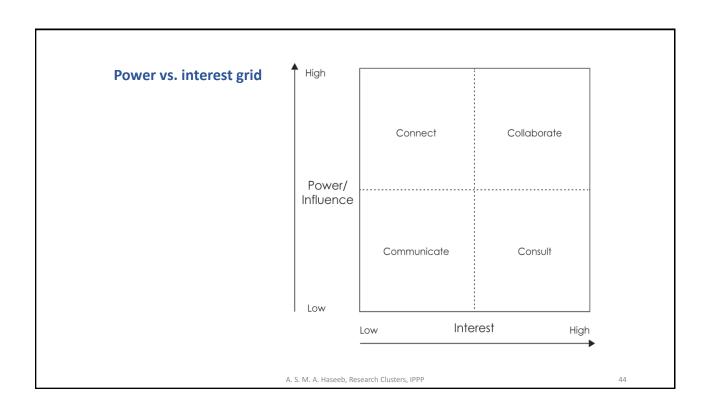
Australian Research Council

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F. RESEARCH IMPACT

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.vork.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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Outline

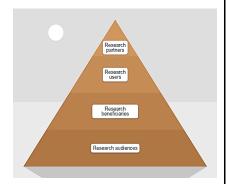
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Research will only have real world impact if it reaches right people

- 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 \rightarrow target research audience
- Journal and conference papers are not research communication

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- 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

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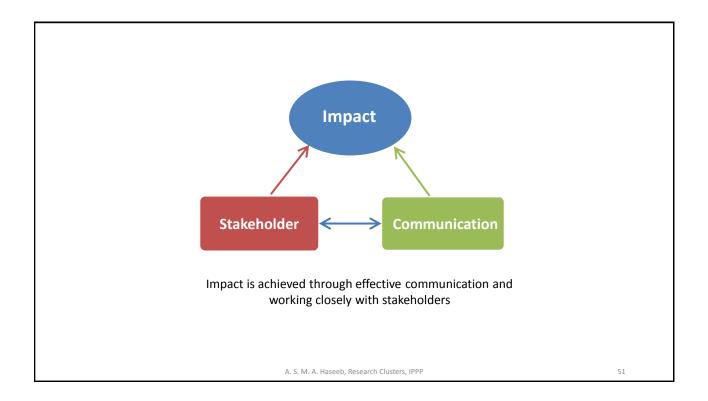
Summary

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- 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

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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

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- · 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

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Identification of research problem to create impact **Traditional approach** Approach for achieving impact e.g., In the context of energy research National renewable energy policy and action plan Research papers Look at bigger picture · Building energy efficiency R&D roadmap Conference papers · e-Mobility technology roadmap National needs, policies Reimagining Malaysian electricity supply industry Interactions with academic colleagues 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 topc/problem of Identify topic/problem which is academically academic interest 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

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Thank you very much indeed!



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Research partners

Research partners are those stakeholders who are with you all the way through a research project and/or are fundamental to realising your research goals. They may also be key beneficiaries or users of your research — the main difference here is that without them your research would not happen at all. Research partners may provide crucial infrastructure, funds or advice, they may broker access to equipment, staff, participants or those research users who can help you maximise your impact goals.

Research users

For your research to have meaningful, long-term impact you need it to be taken up by someone other than yourself or your immediate peers. Research users play a vital role in disseminating, discussing, adapting, developing and adopting research. They can be found in any sector of society including charities, government departments, industry and special industry groups. Which users you engage with depends entirely on your field of study and the type of impacts you hope to have. For example, translating research from the laboratory to the pharmacy will require researchers from other disciplines, both inside and outside of academia to engage with your research, as well as commercial companies, medical regulators and even pharmacists.

Research beneficiaries

It's important to think about those who might be affected either *directly* and *indirectly* by your research. For example, imagine that you want to introduce a new therapeutic approach for a chronic but prevalent condition. You would need to engage directly with patients and patient groups but also those who will be impacted indirectly, such as carers, family, even employers or local health authorities.

Research audiences

No matter what your research, someone will always be interested in what you do. The general public and the media are always interested in research which gets them thinking and talking, provides new insights or involves cutting-edge technology. They may also want to know more about your research because it intersects with their own interests or needs or has a specific meaning for their demographic, occupation, home town etc.

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Low interest, high influence:

Connect

Stakeholders in this category may only be indirectly affected by your research but they can contribute a high level of expertise, resources or influence. You will need to engage with these stakeholders throughout the lifetime of the project and they will often act as consultants. Where appropriate, they may also inform decision making. If all goes well, by working with these stakeholders you will increase their willingness to engage, so you should regularly reassess your relationship.

High interest, high influence:

Collaborate

This is the highest priority category. These stakeholders are key players in the delivery of your research and impact goals. They need to be fully on board to make the project work and should ideally be part of the project governance process.

Low interest, low influence:

Communicate

Low-priority stakeholders with relatively low levels of interest and influence will be placed in this area. Your engagement will mainly involve keeping stakeholders up to date regarding the progress of the project. You should always monitor and regularly reassess the position of stakeholders in this area as their influence or interest could increase, depending on circumstances.

High interest, low influence:

Consult

Stakeholders in this category are directly affected by your research but have minimal expertise, resources or influence to help you realise your goals. You should consult with these stakeholders early on to establish communication and help shape research goals and methodologies. These stakeholders may also act as disseminators and (with any luck) goodwill ambassadors.

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

Set goals

why is your research important? specific problem you are trying to solve? Applications of your research? Visualise success and work backwards from there!

Identify stakeholders

Identifying your stakeholders and getting them involved in your research early on is pivotal to achieving high quality impact. Think about who will benefit from your research and why.

Plan impact-related activities

plan the activities that will potentially lead to impact.

they should be relevant, engaging and delivered through the most effective channels. Remember that the aim of the activity is to increase the likelihood of achieving impact

Capture evidence of impact

capture evidence of impact as it emerges.

kind of evidence that you need and the best way of recording and monitoring your progress.

Report impact

provide evidence of the impact you have achieved and demonstrate the success of your impact-related activities

If you have strong relationships with your stakeholders and captured evidence of your impact on an ongoing basis then this part of

Maintain relationships

Impact is something that you will continue to develop throughout your career and it has the potential to evolve far beyond the timescale of a single research project.

the process will be easier because you will have everything you need to demonstrate the impact of your research.

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

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