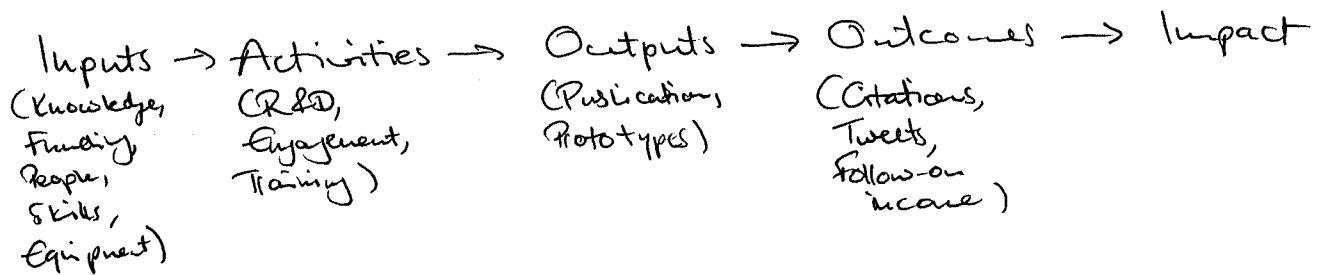# Planning your research career for impact

Speaker: Dr Faith Welch

- Research Impact is the contribution of research to society, environment, economy (outside of academia)

- Different types of impact:
  Understanding & awareness, attitudinal, economic, environmental, health & wellbeing, policy, cultural, capacity or preparedness

- Impact can be positive and negative

- Results-Chain Framework:

  Inputs → Activities → Outputs → Outcomes → Impact
  (Knowledge,   (R&D,   (Publications,   (Citations,
  Funding,   Engagement,   Prototypes)   Tweets,
  People,   Training)   follow-on
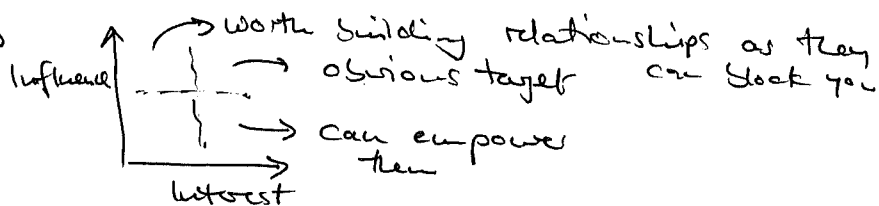 Skills,   income)
  Equipment)

- Planning:
  1. Impact goal
  2. mapping stakeholders
  3. engagement plan
  4. implementation goal

- Impact Goal:
  - What is the challenge / problem?
  - How big is it? (How many people?)
  - How do you know it's a problem?
    (Look for evidence)
  - How can you research help?
  - How is it different from existing research?
  - Assume you've successfully addressed the challenge — what did you achieve?

- Impact goals should be SMART — Specific, Measurable, Achievable, Realistic, Time-bound

- Mapping stakeholders: Who might have an interest in your research, for good or bad?
- Prioritising stakeholders
  → Money might be another axis
  → be super specific

- Engagement plans:
  - should be mutually beneficial
  - there can be different expectations across cultures, communities, types of organisation
  - it takes time
  - don't be a burden
  - Steps of engagement:
    inform < consult < involve < collaborate < empower
  - Types of engagement:
    Webinars, press release, newsletter, survey, public events, training, co-design workshops, project advisory board, secondments, focus groups, hui, policy dialogues
  - Output Plan: (should be a living document)

Stakeholder	Status of Relationship	Reason for Engagement	Engagement activities	Potential challenges/barriers
...	...	...	...	...

- Things to keep in mind:
  Risks, Roles & Responsibilities, Expertise, Evaluation, Budget, Timeframes

Understanding Funding Opportunities in NZ
(Youngman Gu)

- Funders want to fund research that aligns with their vision

Tony Hickey (CSBS)

- Pitch with a solid, clear, and interesting answerable question
- Your proposal needs to stand out
- Write understandably — the panel likely won't be experts
- Structure: EOI
  - Problem (start with a bang)
  - The fix
  - Background & precise definition of problem
  - What we can offer
  - How we will do it; break it down, structure it; make it flow.

    Make sure your goals don't build on one another (if Goal 1 fails, Goal 2 should still be achievable)
  - Conclusion — tie back to the problem
- Be positive and forthright (we will > we aim to)
- Avoid adjectives where you can
- Summaries are important → make understandable

Second stage:
- Tell a story; teach them something
- Show that you read the literature
- Show you can do it; preliminary results are good.
- Cook medium rare (don't make it look like you're halfway done)

Xavier for Templeton, Mar 27

Attendees: Kathryn, Xavier, Gerald, Yun Sing, Casper

- US-based with advantage for US researchers
- Inter-disciplinary, 10% and above input
- about development of person, how does collaboration improve the character?
- choose your best team rather than choosing a strategic team
- if we make it past the 1st stage, we have a very good shot at the 2nd
- try first proposal below 1m USD
- check out funding areas for similar projects
- focus on human development
- internal deadline for Stage 1: ~ July
- team size: 1/2 leader, 1-2 supporters; flexible on role, CV is important
- 30 month projects; 234.800 USD cut-off ~390.000 NZD
- uni support: concept paper to Casper, budget with Kathryn & Xavier
- no PhD students → research assistants, Postdocs
- overheads 15%.

- weave a bit of "public engagement" in
- multiple research goals with a leader or a "suitable person" for each goal
- they will look at lead persons' publication list and background

- they want to understand where exactly their money goes.
- provide value for money
→ give a draft with ideas to Caspar so he can understand and he will help; CC Kathryn & Xavier
→ think about human development aspect.
→ start budget early

Gerald MBIE Pitch

Max:
- (+) Sustainability ...
- (+) Measurability
- (+) Maori data sov. makes it particularly
  useful for NZ

Q: What's special about your solution?
→ we offer flexibility and adaptability
and a _different_ focus.

Q: NZ has 80% green energy, how is this actually
reducing carbon emissions?
→ it's decreasing usage

Rob was creating highly skilled NZ jobs is something particularly
attractive to ~~MBIE~~ MBIE, what would our project
mean in terms of jobs?
open it up to pacific islanders or indigenous
people in general

What are the measures for the unified interface's success?

You rely a lot on collaboration - have you reached
out to anyone yet?
We're finalizing the proposal now, then contact
cloud providers

What's the ambitious part of the science?

Do you have preliminary evidence to show that you
are actually able to do the science?
→ experience in trying around projects

What do you mean by making the cloud "fair"?
How do you do that, and how do you
ensure companies don't just try to crank up
the prices?
~ somewhat fuzzy

Burkhard mentioned _DUC_ Solutions - how does it relate?

What's the target market?

→ SMEs

⇒ need to define technical advantages
⇒ focus on dat. cov and other indigenous grps?
⇒ mixed scoring board to evaluate (dashboard)
⇒ prelim. evidence would be good.
⇒ pathway to implementation needs to be stronger

Giovanni: <u>Understanding</u> Flooding Susceptibility through
a Holistic Human-Centered Approach

JCS:

① Freshwater quality is a significant issue
① combining diverse datasets is ambitious
① Climate change
Impact: what are the interventions? How do I
know this is gonna turn into actions rather
than understanding?
    → adv. reasoning: what's the minimum change
        we need to do to get the effect we want?

Are you taking into account all environmental
    factors? How can you be sure that if
    you fix the water, you don't break other things?
    → that's why we do case studies

Will the Maori knowledge be available in time
    to influence model development?

Data sov. issues will come up → build resilience.

Climate change is a strong argument, because
    existing models are too static
        → might repitch like prepared for climate change

Stakeholders: you're missing primary sector; you
    can expect kick-back, eg Dairy vs Beef&Land
Business Model: is it gonna be free? Closed? Training
    to use the model?
    → Open-Source; need training support

Ethics: would the model disadvantage anyone?
   Small businesses? Give some thought to the
   poor & vulnerable. Have small land users in advisory
   board?

Focus on the positives; positive mitigation industries.
   Give positive rewards for farmers doing well.
   Focus on individual farmers

Have you identified where the missing bits of
data are?
   Sparse areas; fertilizers causing 20 year effects,
   etc. → do you know what you are
   missing?

Include social & economic effects more thoroughly.
VM needs more love and care. Bring potentially
negative stakeholders in early.

Michael: Differentiable Organisations

Yun Sing: Estimating air pollutant emissions and
   exposure in real time using machine learning

Jing: AI-Driven Automated Software Production

Diana: Happy cities. Developing AI technologies for better
   socio-cultural wellbeing in urban environments

Vithya: Detect and Mitigate Bias in Language Models:
   An Indigenous Perspective

Sandeep, Aug 15
- ask contract extension

Background:
- MBIE Smart Idea
  - → Identify genes for ML
- Samples from rumen; purified RNA; sequenced messenger RNA (mRNA)
  - ↳ codes a protein, but we don't know which function it has
- understand methanogens in the rumen
- → which ~~chemical inhibitors~~ parts of the gene produce methane?
- in NZ: chemical inhibitors that need to be eaten (infeasible)
      OR   vaccine (feasible)
- methanogens interact with microbes in the rumen

- How do high/low sheep differ on mRNA level?
- which genes correlate with methane production?
- Feature Selection | How do the mRNAs interact with each other?

Data:
- Counts: rows = mRNAs; cols = sheep on 2 days
- Date = Date of measurement
- System# : Sheds
- Chamber# : ~~Ch~~ Physical Chambers in Shed
- Sheep# : Ear ID Tag
- CH4 (g/day) : Methane Emission; should be considered into relative to food
          (DMI = Dry meta Intake)

CO2: Methane converting to CO2

H$_2$: Hydrogen they produce inside the rumen
used to produce methane

H$_4$/DMI: Target

average: averaged target → ok to use average

Volatile Fatty Acid Data (VFA)
produced as result to degradation in rumen
→ indication if methanogens are active or not
A/P: Acetic/Propionic (col G/H)

· explainable, visualization, make understandable
~> understand genetic networks in rumen
· access to large dataset to validate

(Keg Pathway
Analysis?)

· any time; whatever I need;
Some model end of Nov

next meeting: Sept 5

Killcals: soil samples