The value of our research

LANDCARE RESEARCH
MANAAKI WHENUA

Thanks!

Programme Bids	Smart Ideas
Winning with Wildings	'Biosecure-ID': Machine learning to automate image-based species ID
Better management strategies for dairy farms	Wetland Assessment and Monitoring Tool: Pre-human baselines for assessing, monitoring and restoration
Building resilience and provenance into an authentic Maori honey industry	Optimal release strategies to maximise biological control: RHDV in rabbits
Security for iconic species: kiwi rescue	The "Achilles Heel" of pest control
Soil health: Oneone ora, tangata ora	
Next Generation S-map	

Evaluate the value of LR science:

Across four sectors:

- Natural Resources Sector
- National Science Challenges
- Maori
- Primary Industries

How can we increase the impact of our research?

NZ science globally

Country	Citation ranking	Number papers	Citation impact	Public / business R&D	Papers in top quartile journals
USA	1	3,295,715	1.28	103 / 134	63
China	2	1,484,687	0.86	-	-
Germany	3	768,106	1.33	156 / 137	77
England	4	809,977	1.42	80 / 90	134
France	5	525,509	1.30	115 / 112	79
Australia	9	396,563	1.36	132 / 101	135
Denmark	**18**	**111,966**	**1.64**	**169 / 134**	**183**
Singapore	**23**	**82,202**	**1.41**	**-**	**-**
Israel	**24**	**96,873**	**1.22**	**74 / 196**	**137**
Finland	**26**	**83,284**	**1.38**	**186 / 156**	**149**
Ireland	**33**	**67,248**	**1.26**	**56 / 99**	**104**
New Zealand	**35**	**63,835**	**1.51**	**96 / 42**	**148**

LR within NZ

Institution	NZ ranking	No. papers	Citation impact	% papers cited
Univ. Otago	1	12,830	2.03	64%
NIWA	2	1,482	1.55	81%
Landcare Research	**3**	**1,497**	**1.53**	**77%**
Univ. Auckland	3	17,735	1.53	61%
Lincoln Univ.	5	1,344	1.38	72%
Victoria Univ.	6	6,108	1.35	58%
GNS	7	1,172	1.35	80%
Massey Univ.	8	6,668	1.31	63%
Univ. Canterbury	10	5,963	1.29	65%
AgResearch	10	1,653	1.29	74%
ESR	12	402	1.26	75%
Plant & Food Research	13	1,437	1.23	73%
Scion	17	487	0.93	71%

Disciplines within LR

Discipline	No. papers	% NZ total	Citation impact (LR)	Citation impact (NZ)	LR ranking in institutes
Ecology	478	18%	1.51	1.41	12 / 307
Plant Sciences	218	15%	1.36	1.26	34 / 331
Environmental	168	9%	1.25	1.33	38 / 450
Zoology	144	13%	0.73	0.94	15 / 266
Entomology	111	22%	0.92	0.96	16 / 174
Biodiversity	93	16%	1.43	1.48	14 / 166
Soil Science	90	21%	1.20	1.52	19 / 165
Mycology	73	43%	3.05	1.78	4 / 185
Geosciences	73	4%	1.65	1.38	41 / 292
Evolutionary Biol.	59	8%	1.85	2.02	21 / 256
Forestry	58	14%	1.56	1.06	16 / 160
Geography	50	8%	1.61	1.41	22 / 181

LR ‘conventional’ metrics

- Academic impact is a key metric
- LR in top 16% research organisations, globally
- Joint 3rd in NZ, ahead of other CRIs
- Range of disciplines where we are globally competitive
- Citation metrics skewed by few papers: 3% papers accounted for 39% of citations (23% not cited at all)
- 41 staff authored our top 50 papers: 15 no longer work for LR

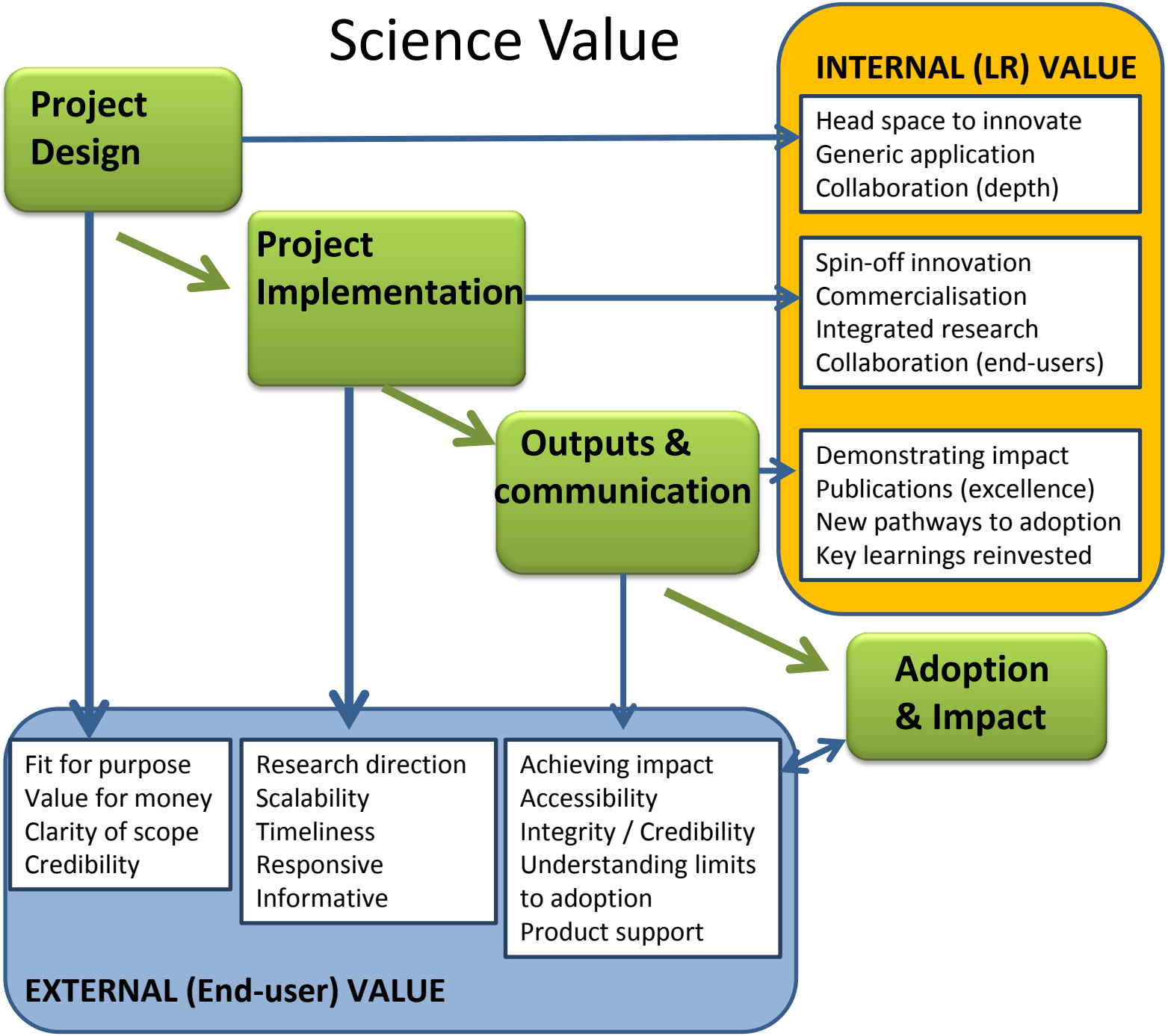
What is excellent science?

The Best People	A Rigorous Approach	Optimum Results
Individuals, teams , institutions well placed & skilled for research, sought after practitioners with reputations for high quality work, linked internationally and domestically	Well-defined, repeatable methodologies, careful implementation. Transparent and stringent peer-review. Best practice approaches. Risks identified and managed	Expansion and application of knowledge, wide dissemination, highly reliable and repeatable, strong application. International reputation enhanced

What is excellent science?

- Academic excellence
- Impact and adoption (finding solutions)
- Outcomes and Outputs
- Fit for purpose, client focus
- Delivers value to us and our clients

Science Value



Value case studies

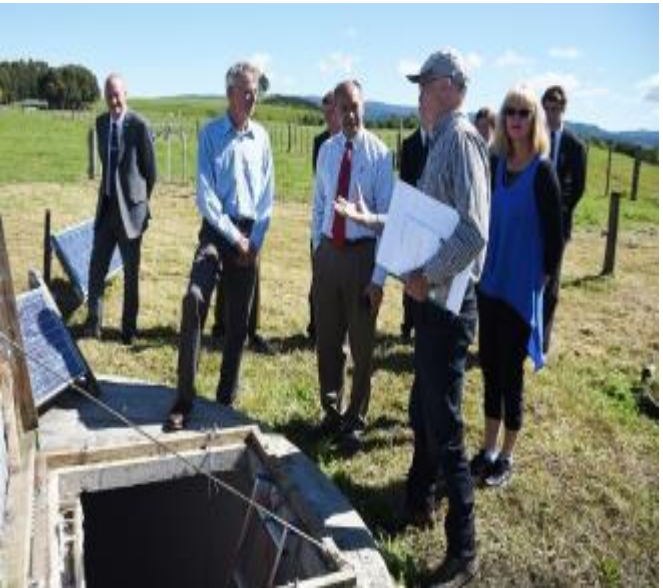
- Natural resources sector
- Primary Industries
- Science Challenges
- Maori

Synthesise results: Excellence

Impact

Collaboration

Case studies



1. Land-cover database
2. Biodiversity indicators
3. Next generation DNA
4. Land visualisation web-tool
5. Māori collaboration
6. Invasive animals
7. Wetlands research
8. Smart irrigation
9. Mixed-species pasture

Key:

Value achieved | value partly achieved | value not achieved | value not relevant

Phase of work	Value	Score	Comment
Design	Fit-for-purpose		
	Value for money		
	Science credibility		
	Clarity for scope of work		
Collaboration & Implementation	Contribution to research direction		
	Scalability		
	Timeliness		
	Responsive		.
	Informative		
Adoption	Achieving impact		
	Accessibility		
	Integrity / credibility		
	Understanding limits to adoption		
	Product support		

Excellence

Every sector values publications:

- Providing credibility to tools or approaches we develop and others adopt
- Informing end-users of technological advances and new opportunities
- Providing rigorous “proof-of-concept” of new approaches to old problems
- Increasing the reputation of our clients with their stakeholders (association)

Publications globally

Global pressure to publish:

- Citations key to funding and careers
- 585,000 per month and rising
- Harder to publish (journals reject 70-80%)

Global response:

- Design research to maximise papers
- Don’t take risks
- Lowers the impact (pulp fiction)

Resilience: Hurricanes & Earthquakes

Hurricanes

- Excellent science about predictions
- Predicted path of Katrina
- No relationship with stakeholders
- 1,800 people died, New Orleans smaller

Earthquakes

- Excellent science about predictions
- Failed so reviewed
- Collaborated with end-users
- Stakeholders 'embedded'
- Maps target response

Impact

- Take end-users / clients on a journey with us
- Identify the problem, then find ‘the’ solution
- Feed back emerging findings
- Design tools and how they will be used (co-design)
- Support and promote tools (business model)
- Concentrate efforts: build the right relationships
- Innovation takes time and is sometimes wrong

The journey to adoption – Agri-business

"Co-design the tools and how they will be used"

"Produce whole solutions"

"Recognise innovation is a long and twisting path"

"Plan for R&D and subsequent support"

Impact with Māori

Bridging Mātauranga Māori and Western Science

- Our role with relatively few staff?
- Knowledge through partnerships
- Brokering role?
- Pick projects and back them

Capacity building

- Whose?
- Clear about scope of project

Collaboration

NZ Science landscape more collaborative:

- Opportunity to increase impact
- BUT, trend to lowest common denominator
- Cut our losses early

Challenges:

- Economy of scale with stakeholders
- Must not ‘give away’ key relationships

Collaboration

Primary Industries:

- Crowded space – be clear about our role
- Need to build trust – go on a journey
- Partnerships and leverage – how we use our funding

Māori:

- Build the right relationships – key influencers
- Don’t try too many

Integration - Māori organisations

“Recognise the holistic world-view is not in silos”

“Take a long view”

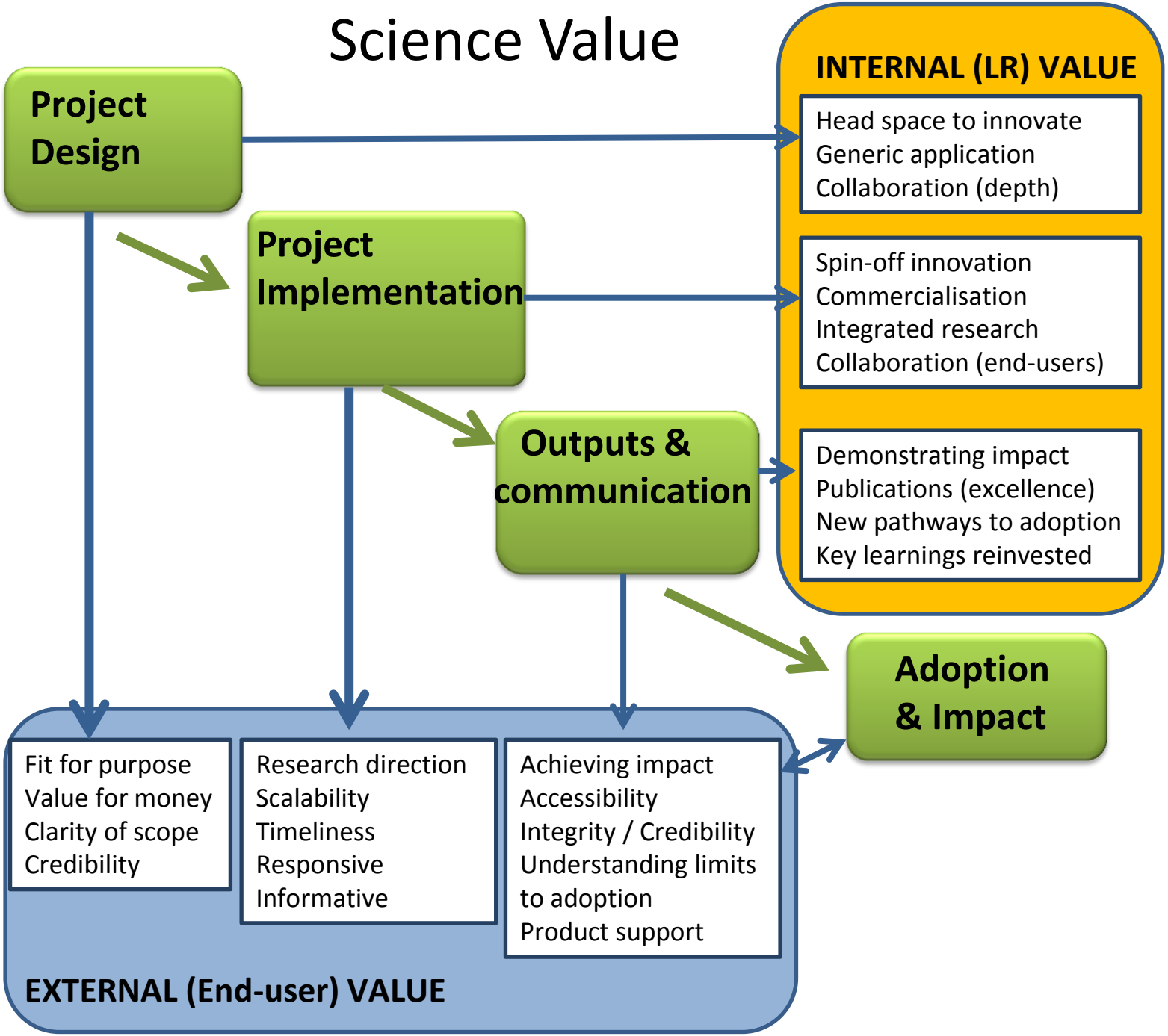
“Meet on the marae, kanohi ki te kanohi”

“Build capability for working across boundaries”

Next steps

- Use score cards at project scoping phase (plan for success)
- Identify potential publications and authors at outset
- Evaluate our success externally
- Build values into:
  - LR ‘promise’ when bidding
  - Comms. and marketing
  - How we allocate core

Science Value



Indicators

Lag

- Citations
- Journal Impact factors
- Collaborative authorship
- Commercial reports
- Confidence of end-users
- No staff in stakeholder workshops
- Licensing deals for IP

Leading

- Identified relevant internal & external values
- Space for writing papers
- Need for integrated research considered
- Good collaboration
- Building a relationship
- Will seek feed-back (score-cards)