Science Foundation Ireland sfi For what's next

Innovating for the future of Farming and rural communities

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History

Problems of the ancient world:

- *Famine*
- *Plague*
- *War*

Unavoidable tragedies beyond the understanding and control of a helpless humanity through scientific research have become manageable challenges

Scientific Progress

For the first time in history:

More people die today from eating too much than from eating too little

More people die from old age than from infectious diseases

More people commit suicide than are killed by soldiers, terrorists and criminals combined

Rapid pace of change

Everything that can be ***measured*** will be ***sensored***

Everything that is ***sensored*** will be ***connected***

Everything that is ***connected*** will be ***automated***

Drivers / Megatrends

Internet of Everything

Data Analytics

Artificial Intelligence

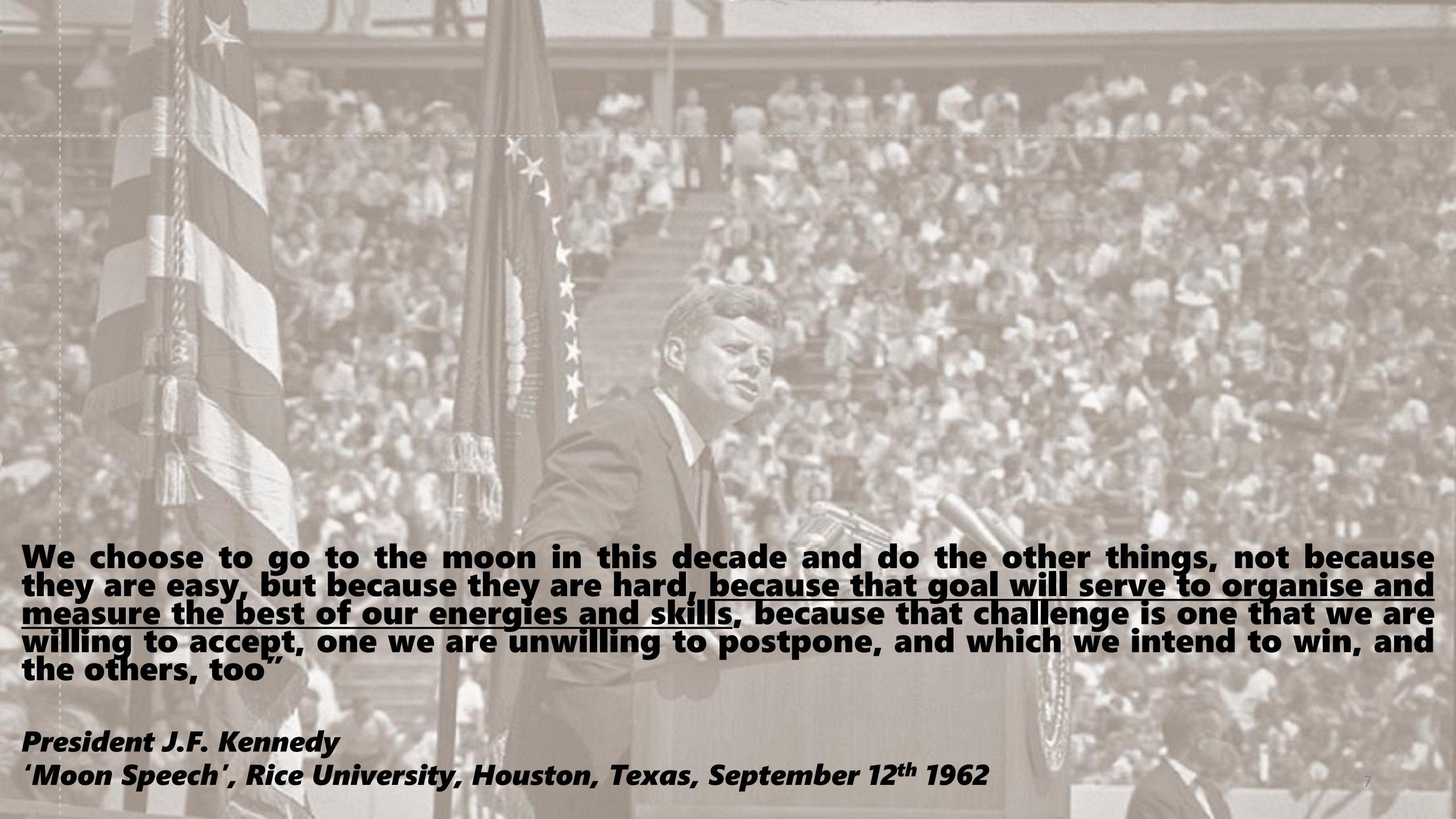
Robotics

Future EU FP9 Research & Innovation Programme

11 Recommendations

1. *Prioritise research and innovation in EU and national budgets*
2. *Build a true innovation policy that creates future markets*
3. *Educate for the future and invest in people who will make the change*
4. *Design the EU R&I programme for greater impact*
5. *Adopt a mission-orientated, impact-focused approach to address global challenges*
6. *Rationalise the EU funding landscape and achieve synergy with structural funds*
7. *Simplify further*
8. *Mobilise and involve citizens*
9. *Better align EU and national R&I investment*
10. *Make international R&I cooperation a trade-mark of EU research and innovation*
11. *Capture and better communicate impact*

http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/hlg_2017_report.pdf



We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organise and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and which we intend to win, and the others, too"

President J.F. Kennedy

'Moon Speech', Rice University, Houston, Texas, September 12th 1962

EU Missions/National Challenges examples

EU "Make the Atlantic Ocean the best understood and most predictable ocean in the world"

Irish "Reduce the immunogenicity of (high value) dairy products"

Challenge Based Funding

Prize Based Funding

- change in law
- provisional licence (better regulation)
- money

Cross DG / Departmental / Government collaboration and efficient lead agency co-funding

EIP-AGRI and H2020 a great example

Future CAP and FP9

AgriTech

- Robotics
- Big Data Analytics leading to rapid, effective, evidence based actions
- Artificial Intelligence
- Machine Learning
- Internet of Things and Value Chain Management
- Automation
- Virtual Reality
- Drones
- Sensors
- Customised Fertiliser
- Customised Feeding
- Autonomous weeding
- Autonomous vehicles etc. etc.

AgriTech – Huge Opportunities

Major convergence of traditional agriculture, IT, Sensors, IoT, Robotics etc.

Positive effects on small and large farms

Increase: Productivity - Sustainability - Profitability - Enjoyability

Encourage highly educated, digitally savvy, young people to develop rewarding careers in future rural farms

Circular / BioEconomy Huge Opportunities

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Stimulate Rural Development

Increase: Productivity - Sustainability - Profitability - Enjoyability

Modern Technologies

Genome sequencing and breeding

CRISPR gene editing

Microbiomes

Longitudinal phenotypic measurement, e.g. ambulatory, temperature, vital signs etc.

Increase: Productivity - Sustainability - Profitability - Enjoyability

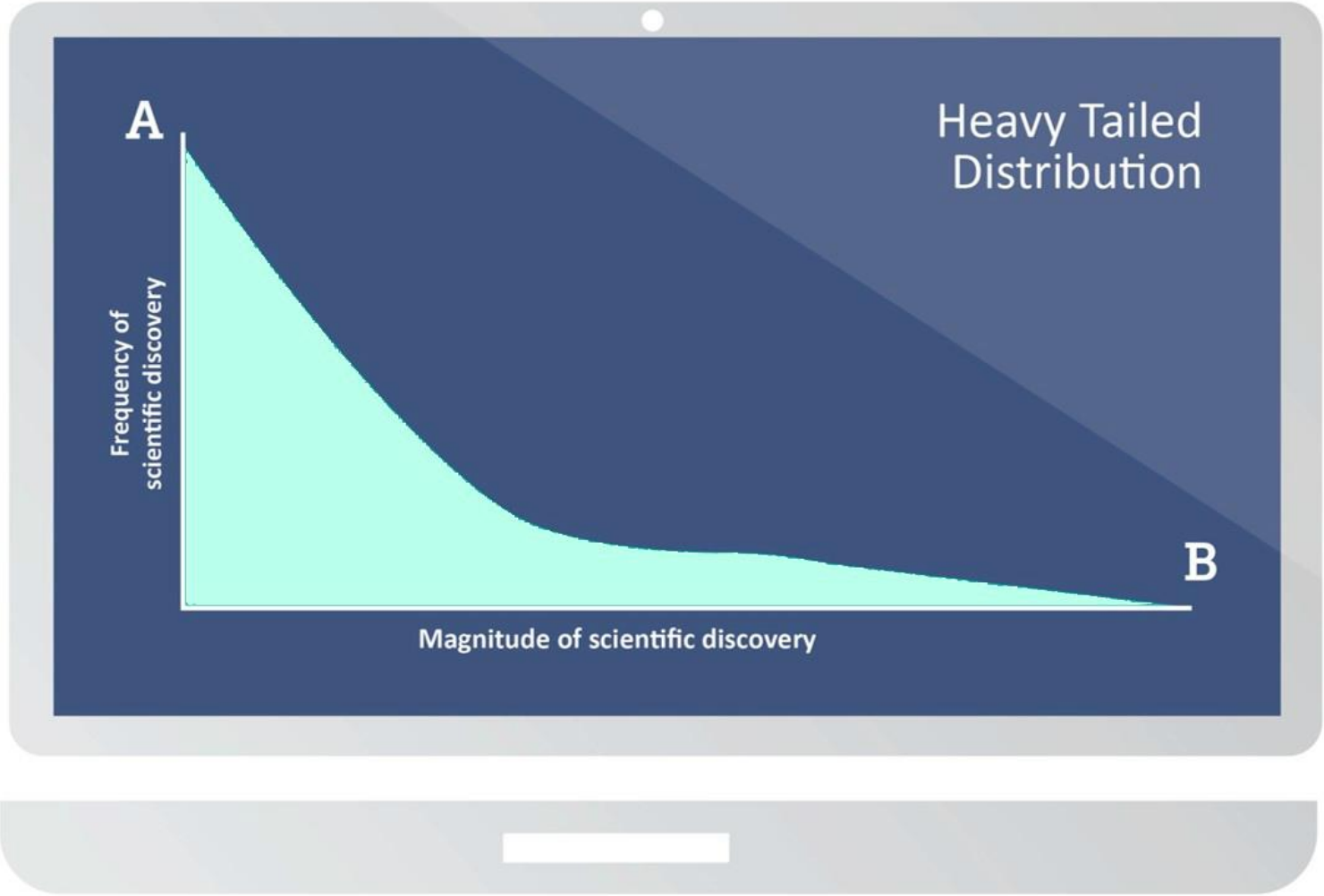
Agriculture / Food / Health / Pharma Convergence

Policy Implications

Encourage:

Disruption
Innovation
Continuous Improvement
Rapid Pace

Frequency versus Magnitude of Scientific Discovery



Science and Innovation Funding

- Excellence is required but is not sufficient, need impact
- Diverse Portfolio of uncorrelated risk
- Intelligent mix between scientists choosing what to research and being told where they should be looking
- The folly of rewarding A whilst hoping for B
- What you Measure is what you Get
- Support for outstanding people, projects, centres, infrastructure, movement, collaboration, exchange, partnership
- Themes

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Excellence

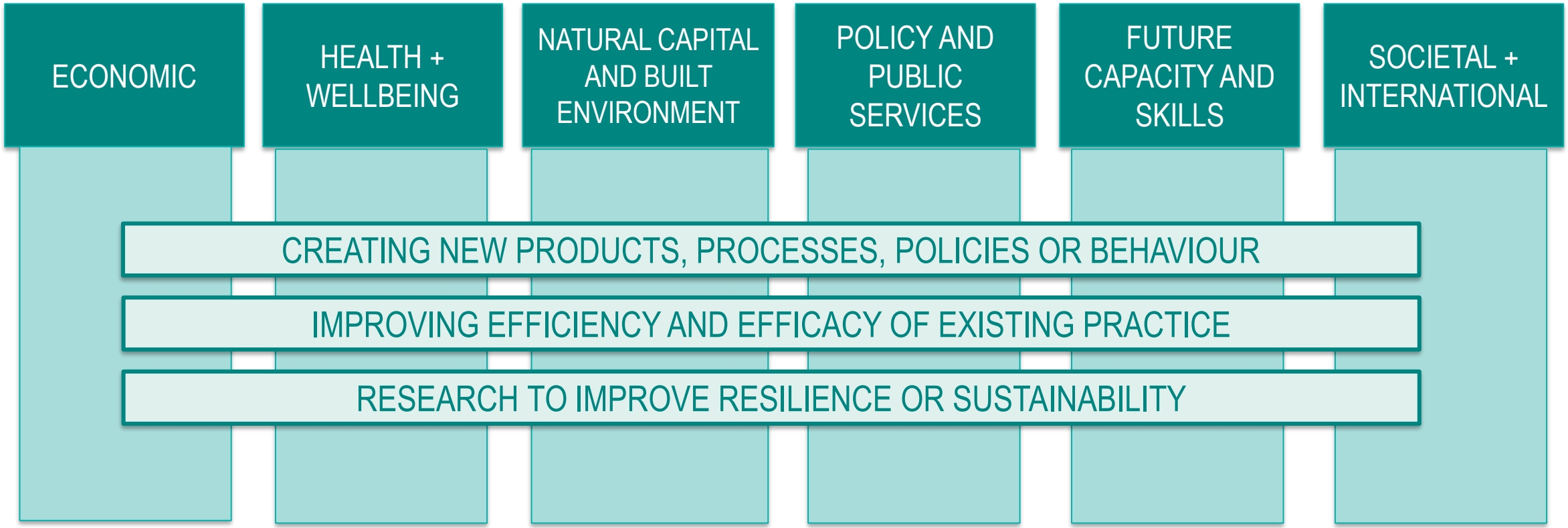
Impact

Talent

What is Impact?

The demonstrable effect that excellent research makes to society and the economy

6 Pillars of Impact and 3 Cross Cutting Themes



Experimental programmes

- Different proposal evaluation methods
- Different funding mechanisms
- Different ways of trying to achieve the same objective

The funder should be as entrepreneurial, experimental, analytical and visionary as the community it serves

Time of Unprecedented Opportunity & Change

- Fast pace of discovery
- Knowledge generation no longer the only rate limiting step – knowledge application
- Innovation is widespread and democratised
- Huge quantities of data –data -> knowledge -> wisdom -> products
- Blurring of disciplinary boundaries with exciting advances at the boundaries / intersections
- Blurring of basic / applied, curiosity driven / use inspired
- Prioritisation
- Scale
- Value for money and accountability
- Need to solve pressing societal / economic challenges
- Significant political and societal changes
- Market share is won or lost at times of change

Focus on Innovation

In uncertain times, investment in innovation will always be an excellent use of taxpayers and shareholders money

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Thank You

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