

# Research and Innovation Strategy in Relation to Declining Resources

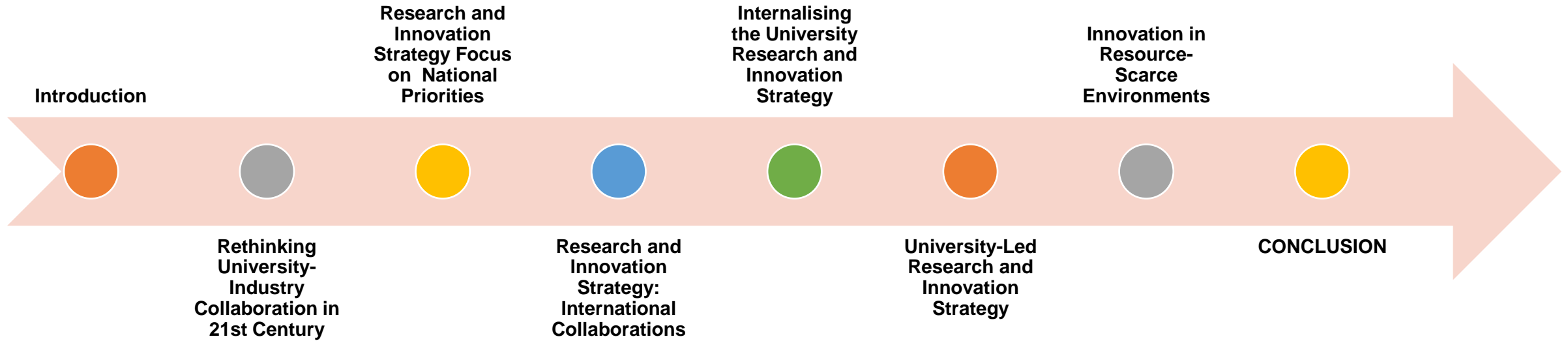


Tshwane University  
of Technology

*We empower people*

**20**  
YEARS  
2004-2024

# Presentation Outline



# INTRODUCTION

*The need for R&D and Innovation towards sustainable development*

- In pursuing societal advancement, it is widely recognised that sustained investment in **Research and Development (R&D)** is critical.
- Fostering **Innovation** is pivotal for fostering progress towards sustainable development, *Scarpellini (2012, p. 1047)*
- In response to dwindling resources, research and innovation strategies have increasingly become central to fostering **Sustainable Development** and efficiency.



Innovation



SUSTAINABLE  
DEVELOPMENT

# Rethinking University-Industry Collaboration in 21<sup>st</sup> Century

## Driving the Research and Innovation Strategy

### Action key Points

- **Bridging the Skills Gap:** Aligning academic programs with industry needs (e.g., digital skills, AI, cybersecurity).
- **Driving Innovation & Research:** Joint research initiatives to address real-world challenges (health, tech, sustainability).
- **Industry-driven Learning:** Internships and practical learning experiences prepare students for the workforce.
- **Fostering Entrepreneurship:** Innovation hubs for start-ups and tech development.



### Case of TUT IFoW and AI Hub:

- **Industry-Academic Partnerships:** Collaborating on 4IR technologies and workforce trends.
- **Skills Development:** Reskilling & upskilling for future job markets (robotics, AI, digital transformation).
- **Innovation Platforms:** Hackathons, incubators, and research initiatives driving workplace solutions.

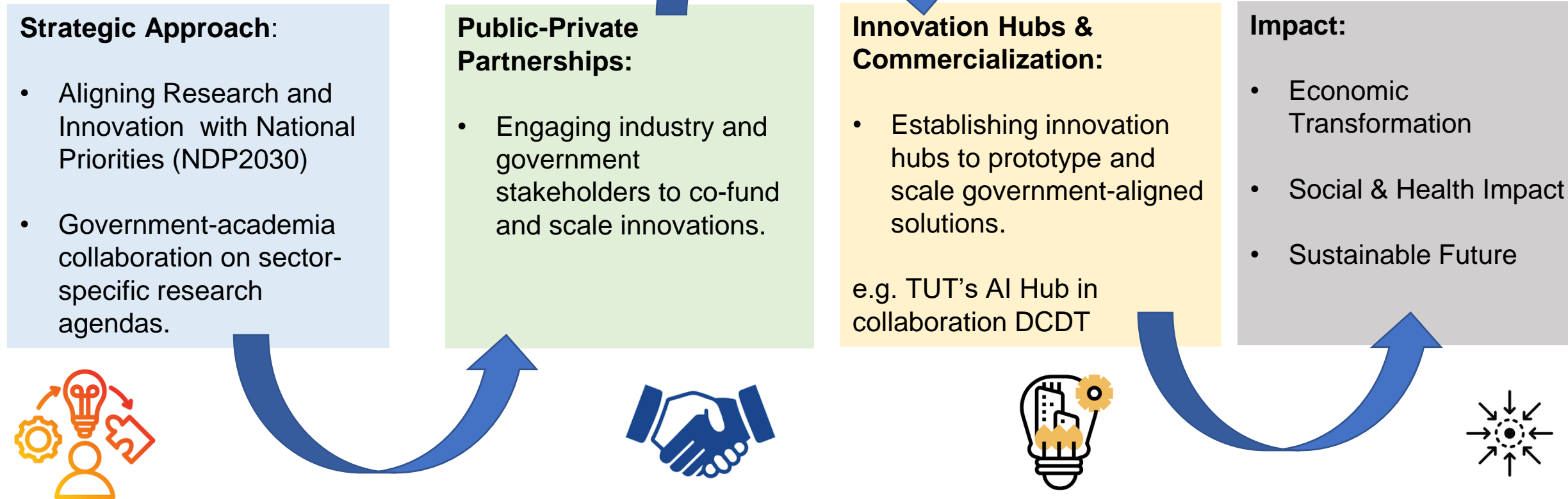


### Impact:

- Enhancing graduate employability
- Future-ready graduates
- Accelerating technological innovation
- Adapting to the changing nature of work

# Research and Innovation Strategy Focus on National Priorities

## *Lobbying Government Funding for R&I*

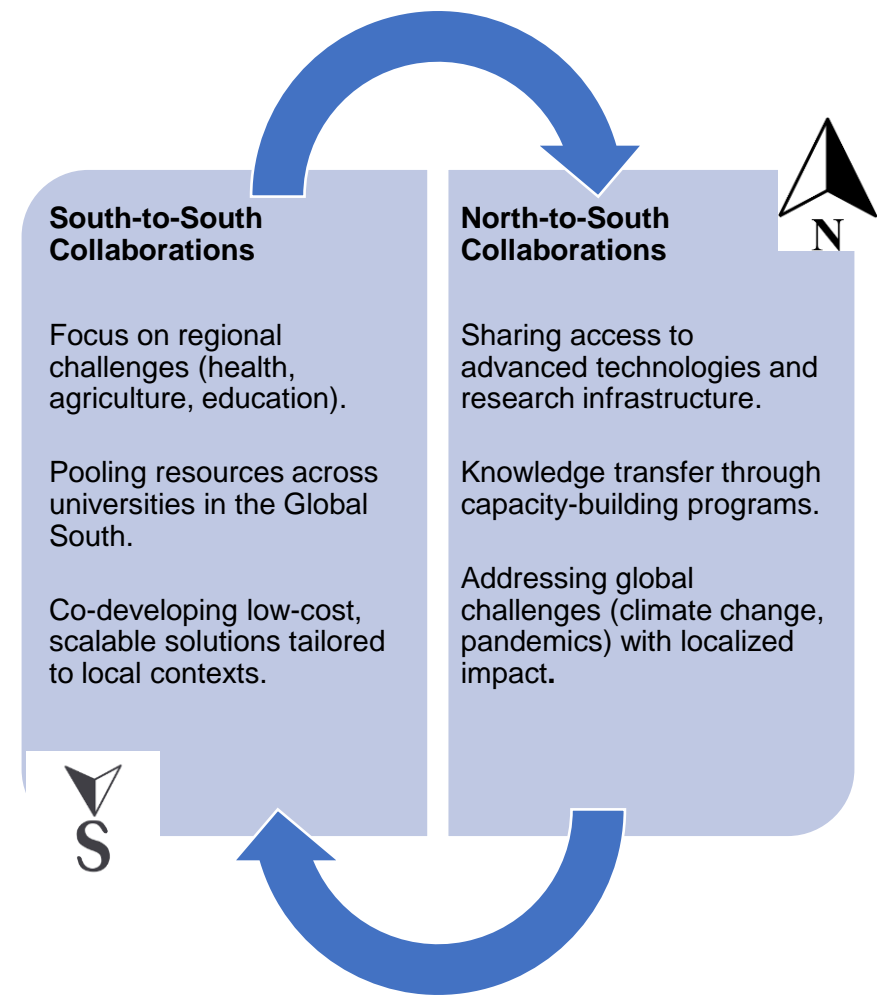
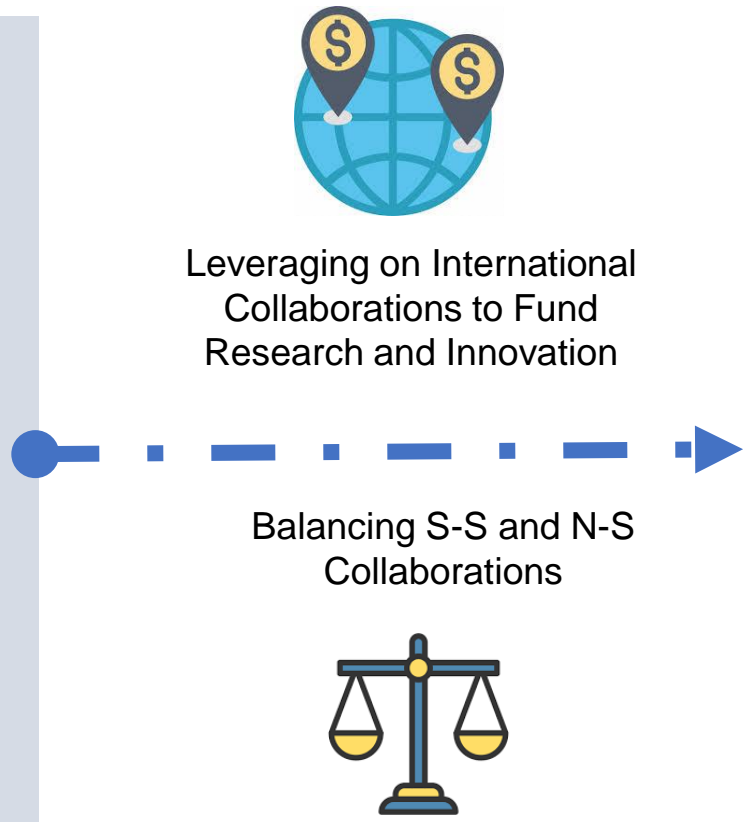


# Research and Innovation Strategy: International Collaborations

*Internationalisation as a solution to declining resources*

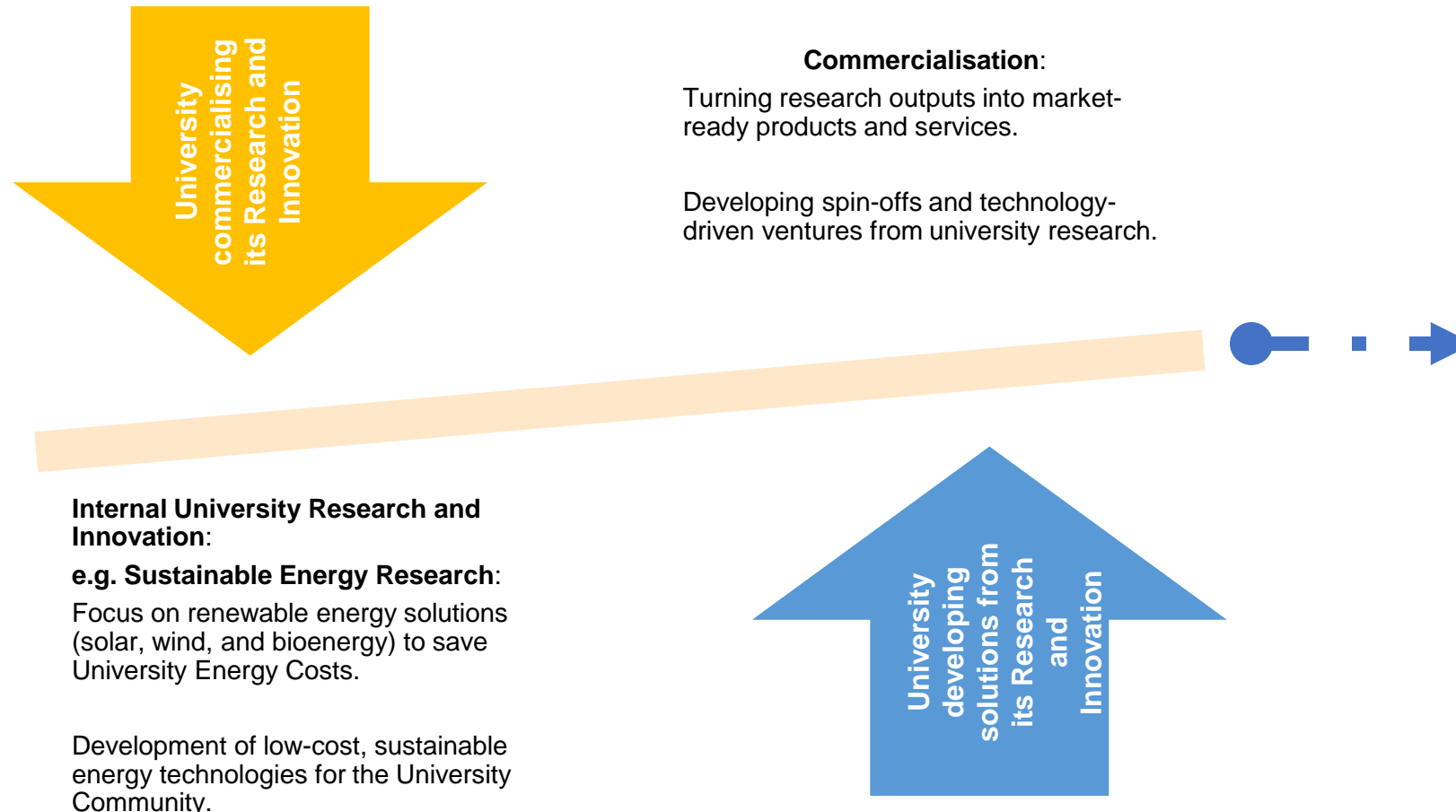
## Challenges of Declining Resources:

- **Reduced Funding:** Limited government & private sector investment.
- **Increased Demand:** Despite shrinking budgets, there is a growing need for impactful research.
- **Competition for International Partnerships:** Limited access to cutting-edge technologies and research infrastructure.



# Internalising the University Research and Innovation Strategy

## Balancing Commercialisation and Internal University Research and Innovation

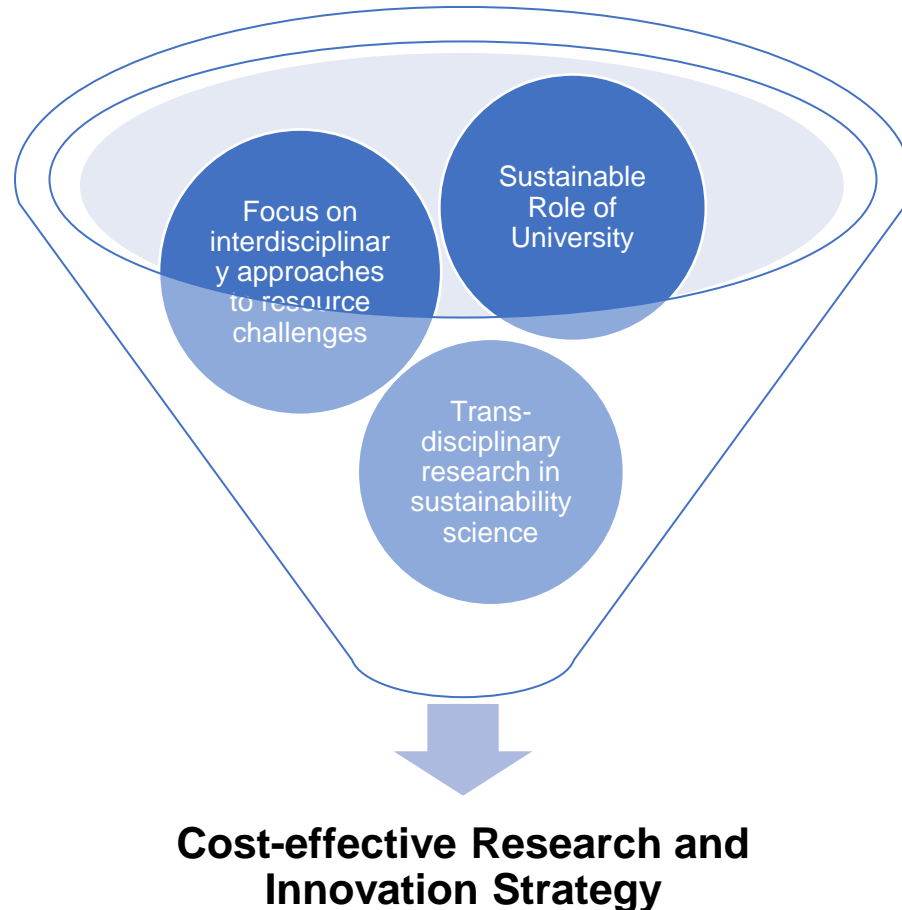


## Impact

- **Revenue Generation:** Commercialisation as a sustainable funding model for research.
- **Green Innovation:** Pioneering energy solutions save energy costs for the University.
- **Job Creation:** Boosting employment through green energy startups and partnerships.

# University-Led Research and Innovation Strategy

## *Addressing the Innovation Hurdles*



- Universities should not only lead in research, but also in developing Research and Innovation Strategies.
- Universities are increasingly needed to establish cost-effective sustainability research centres that focus on interdisciplinary approaches to solving these complex issues.
- The importance of transdisciplinary research in sustainability science, which South African universities are increasingly adopting to develop practical solutions to the country's resource challenges.
- This leadership role of universities instils confidence in their ability to drive change and innovation.



# University-Led Research and Innovation Strategy

TUT's strides towards cost-effective sustainability research centres



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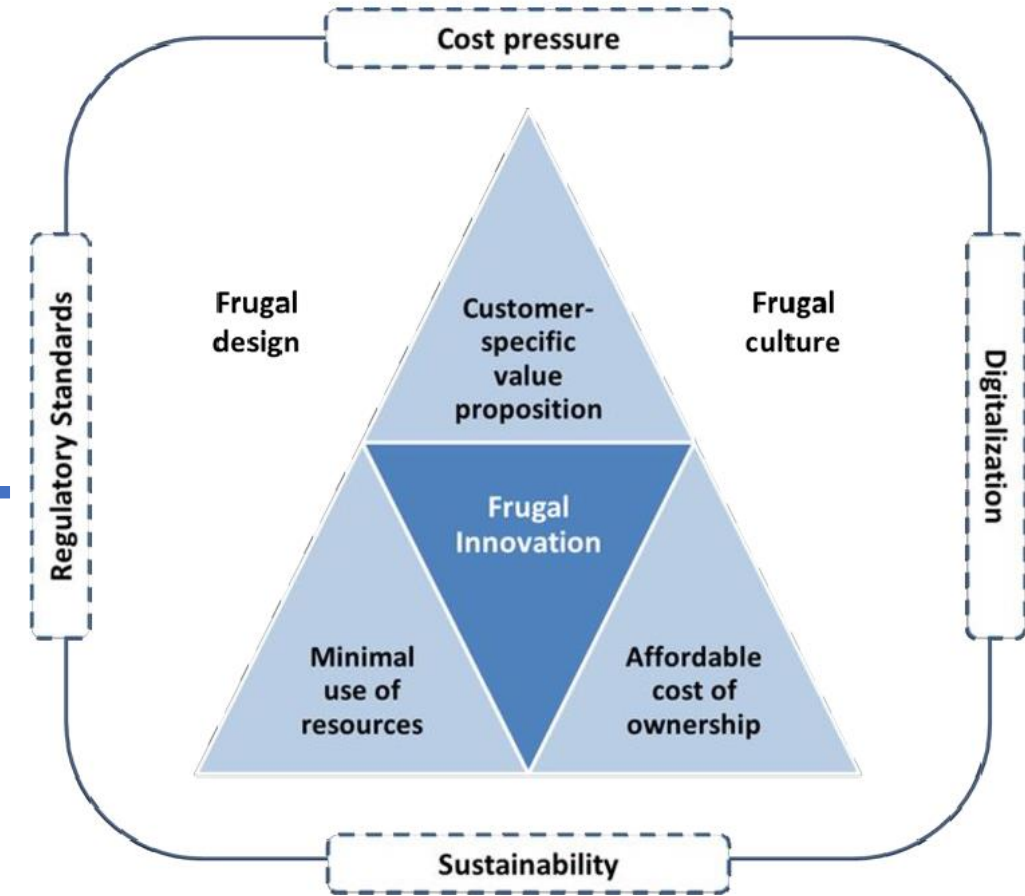
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Office of the DVC: Research, Innovation and Engagement  
Dr Vathiswa Papu-Zamxaka

# Innovation in Resource-Scarce Environments

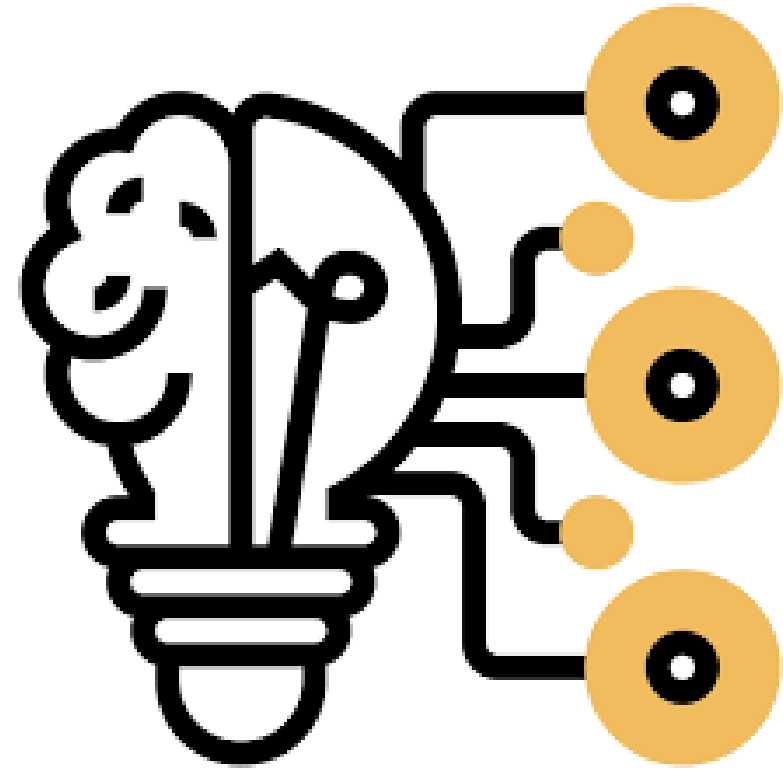
## *The Frugal Approach to Innovation*

- Research and innovation strategies need to be strategically adapted during times of declining resources. One approach that has gained prominence is frugal innovation, which emphasises doing more with fewer resources.
- Universities need cost-effective sustainability research centres to solve complex issues through interdisciplinary approaches. *Radjou and Prabhu (2015, p.3)*
- These initiatives focus on using local resources efficiently and demonstrating the potential for frugal innovation to address challenges in resource-constrained environments.



*R. Tiwari and Stephan Bergmann (2018)*

# CONCLUSION



**Technological Innovation & Frugal Solutions:** The strategy should incorporate advanced technologies and frugal innovation approaches to optimise resource use, enabling more with less in resource-scarce environments.

**Sustainable Innovation & Resource Efficiency:** Emphasise sustainable practices that improve resource efficiency and reduce environmental impact, ensuring long-term viability.

**Collaborative Research & Public Policy:** Foster partnerships between universities, industries, and governments to drive innovation, supported by robust public policies focused on sustainability and resource management.



**#fromGood2Great**