
# Access to Scientific and Technical Information for Development: the Experience of Zimbabwe

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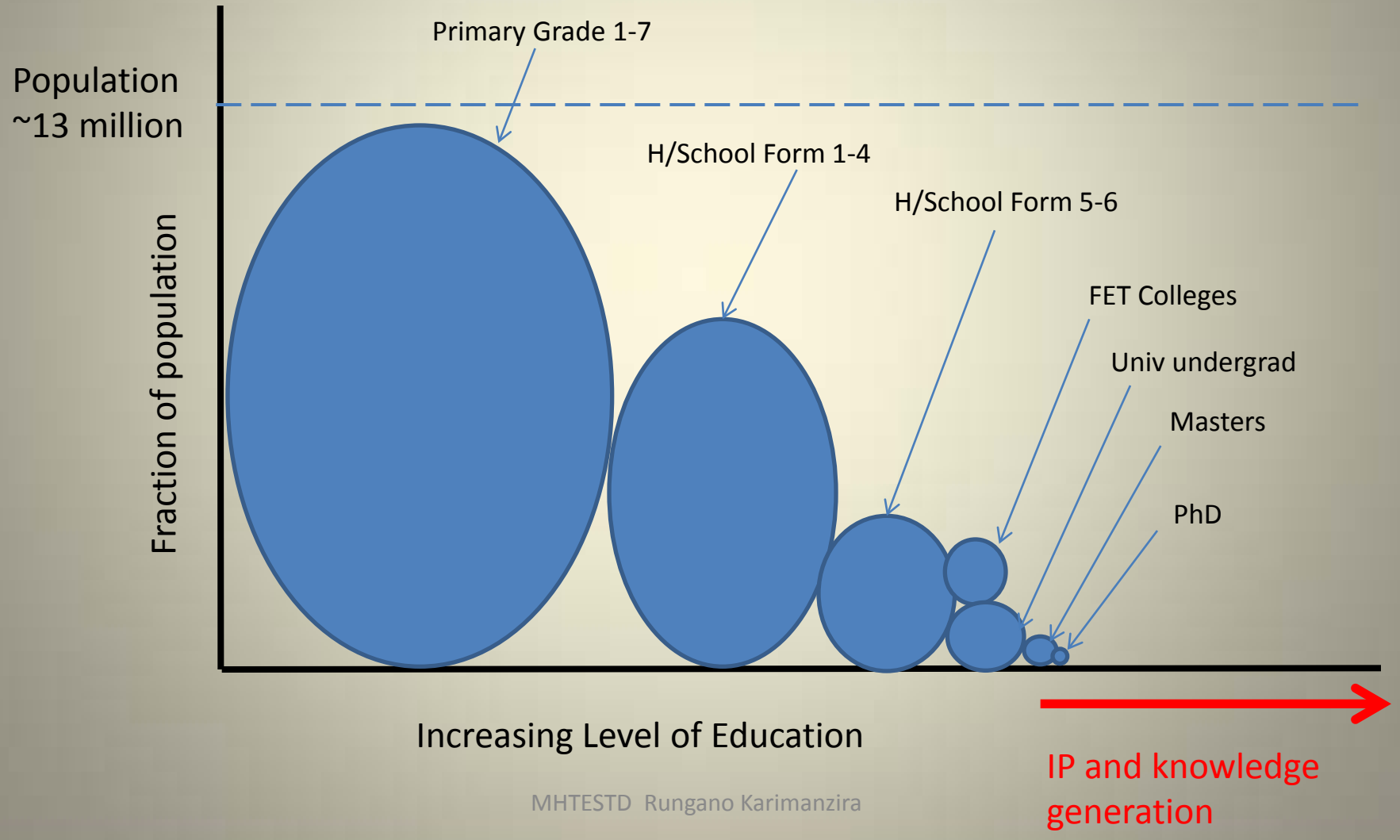
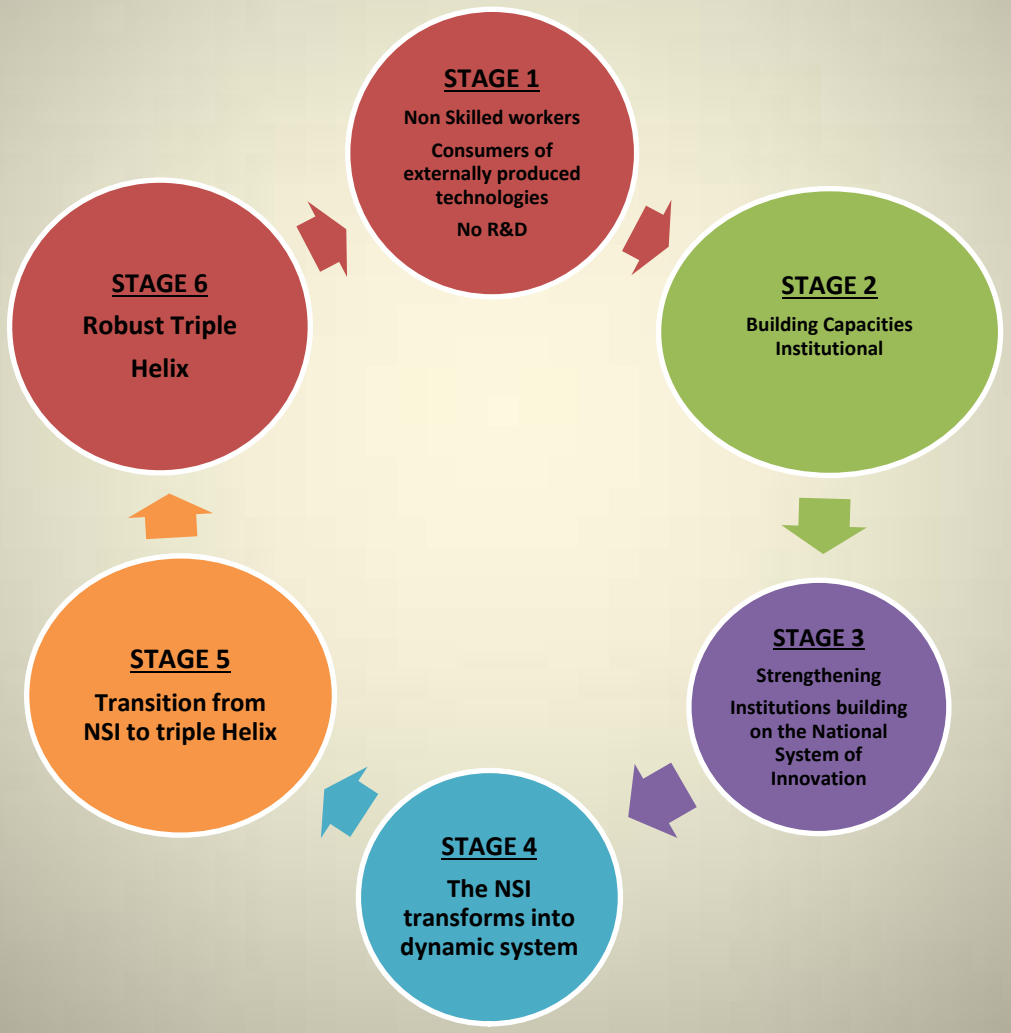
# SETI Stakeholders in Zimbabwe

- 16 (20) Universities
- 8 + R&D Institutions
- 10 polytechnics
- 11 Technical and Vocational Training Education Centres
- 10 Teachers Colleges
- Other private institutions

# IP GENERATION CAPACITY FOR ZIMBABWE



# Mapping Scientific Development



# Stages in Scientific Development

## Stage 1

1. Locals learn operational skills such as driving trucks and performing and assembly work
2. High levels skills including Supervisory work and management are provided by foreign workers
3. Semi processed materials and parts for assembly are imported
4. Education provided at primary and secondary levels
5. Universities few, focuses on humanities
6. No R&D institutions, Linkages with Industries, Intellectual Property and technology Transfer

## Stage 2

1. Learning maintenance and servicing skills including for heavy plants, equipment and electronics
2. Locals can now do supervision while management in the hands of expatriates
3. Universities start teaching science and technology using mainly expatriate lecturers
4. Locals sent abroad to built capacity in science and technology for R&D
5. Few R&D institutions, Linkages with Industries, Intellectual Property and technology Transfer

Reference: Freeman, C. (1995). The 'National System of Innovation'in historical perspective. Cambridge Journal of economics, 19(1), 5-24.

# Stages in Scientific Development

## Stage 3

1. Skills required for repair and replacement of important technology learned
2. More parts for assembly manufactured locally
3. Universities train engineers, technologists and managers
4. Locals start teaching and doing research in universities and R&D institutions
5. Bulk of research funds and research problems are donor driven
6. Linkages with Industries Starts, Awareness on IP starts and Technology transfer starts

## Stage 4

1. Local capacity in S&T and R&D exists
2. Locals develops, adapts and transfer technologies
3. Researchers start addressing local problems
4. Governments recognize the importance of R&D in TD and increase R&D funding
5. Linkages with industries strengthens and industries start funding local R&D
6. R&D clusters identified
7. IP embraced and annual reports include IP generated and registered

Reference: Freeman, C. (1995). The 'National System of Innovation' in historical perspective. Cambridge Journal of economics, 19(1), 5-24.

# Stages in Scientific Development

## Stage 5

- Local R&D produces machines using local materials and suitable for local conditions
- Local Scientists and Researchers involved in applied and demand driven research
- Linkages with industries strong and self sustaining
- IP and Innovation are integrated in the research culture of the university and R&D institution

## Stage 6

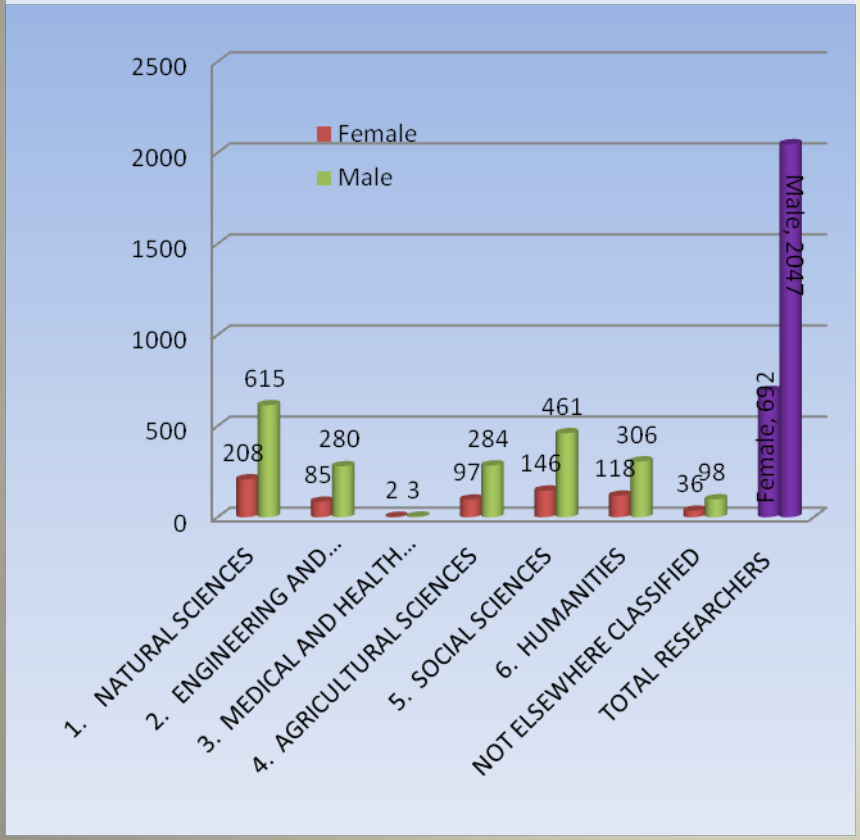
- Local capacity available to produce machines which produce machines
- Linkages with industries very strong and R&D institutions produce new industries
- IP and Innovation are integrated in to the research culture of the university and R&D institution

**Reference: Freeman, C. (1995). The 'National System of Innovation' in historical perspective. Cambridge Journal of economics, 19(1), 5-24.**

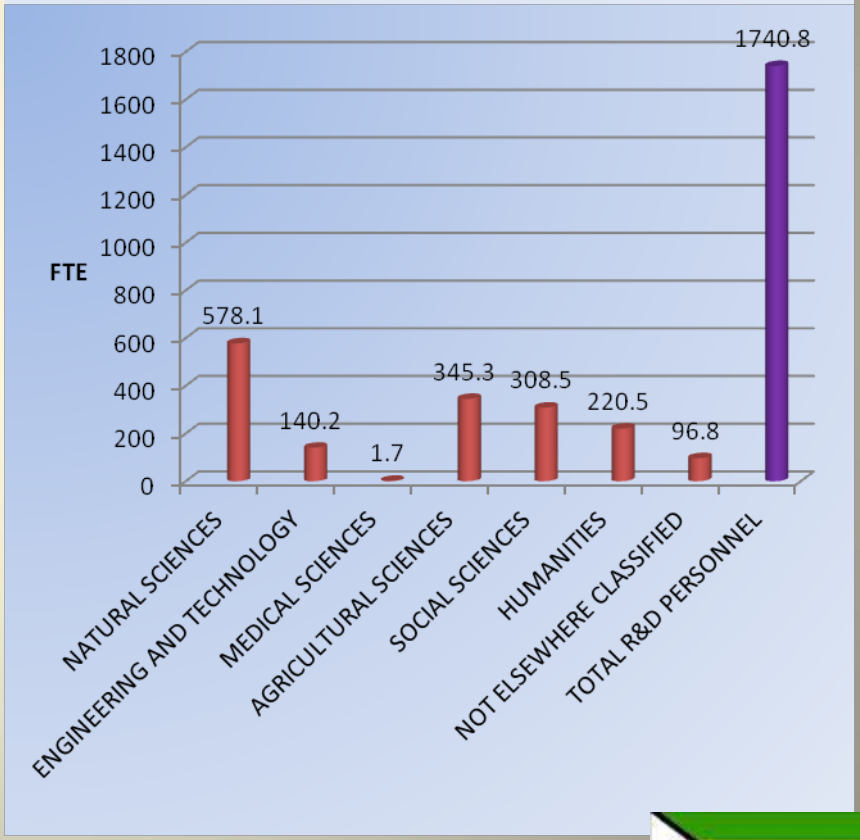
# Zimbabwe case

# KEY DRIVERS TO IP GENERATION

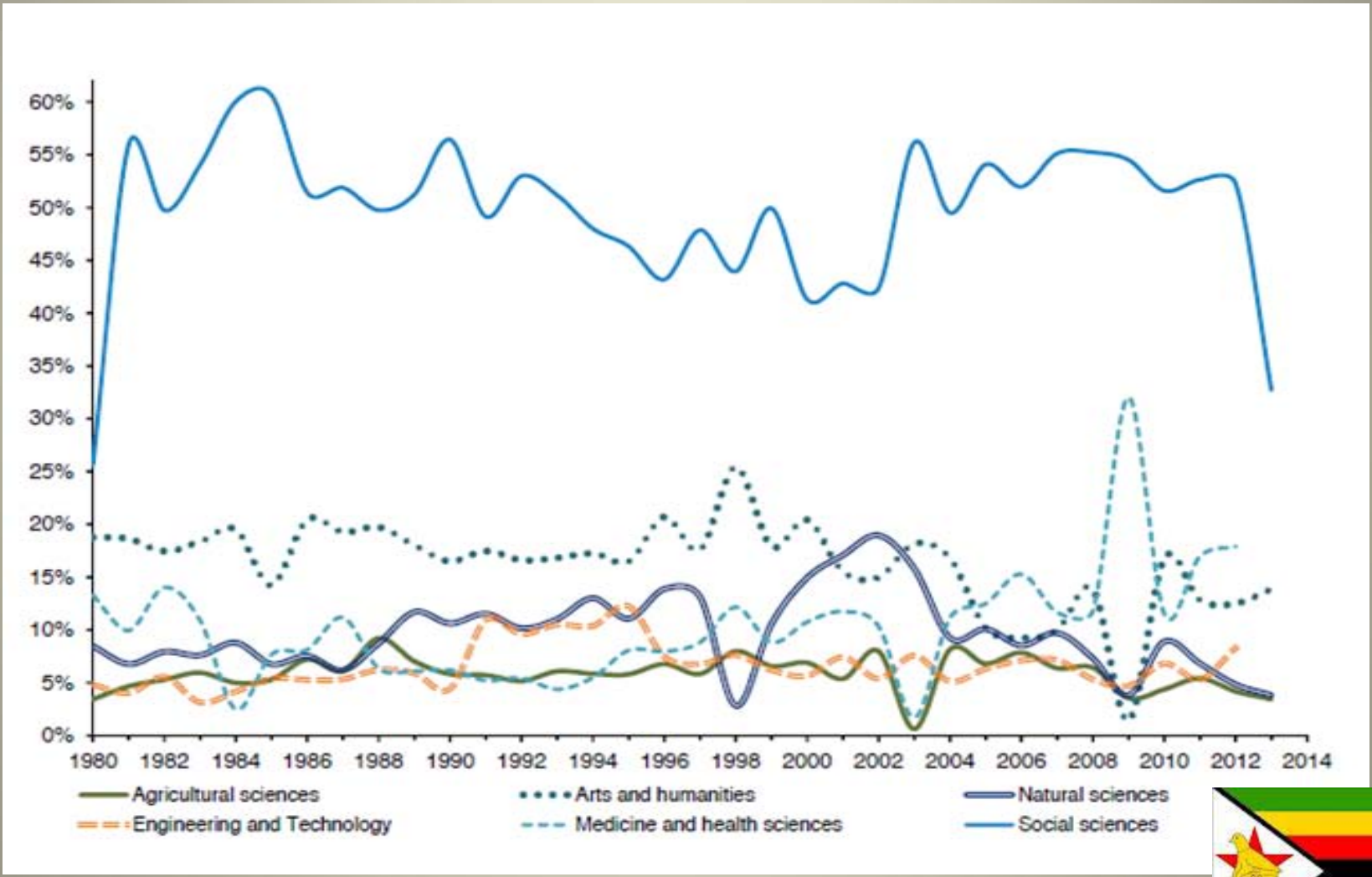
**National Researchers Headcount by Field of Science and Gender 2012**



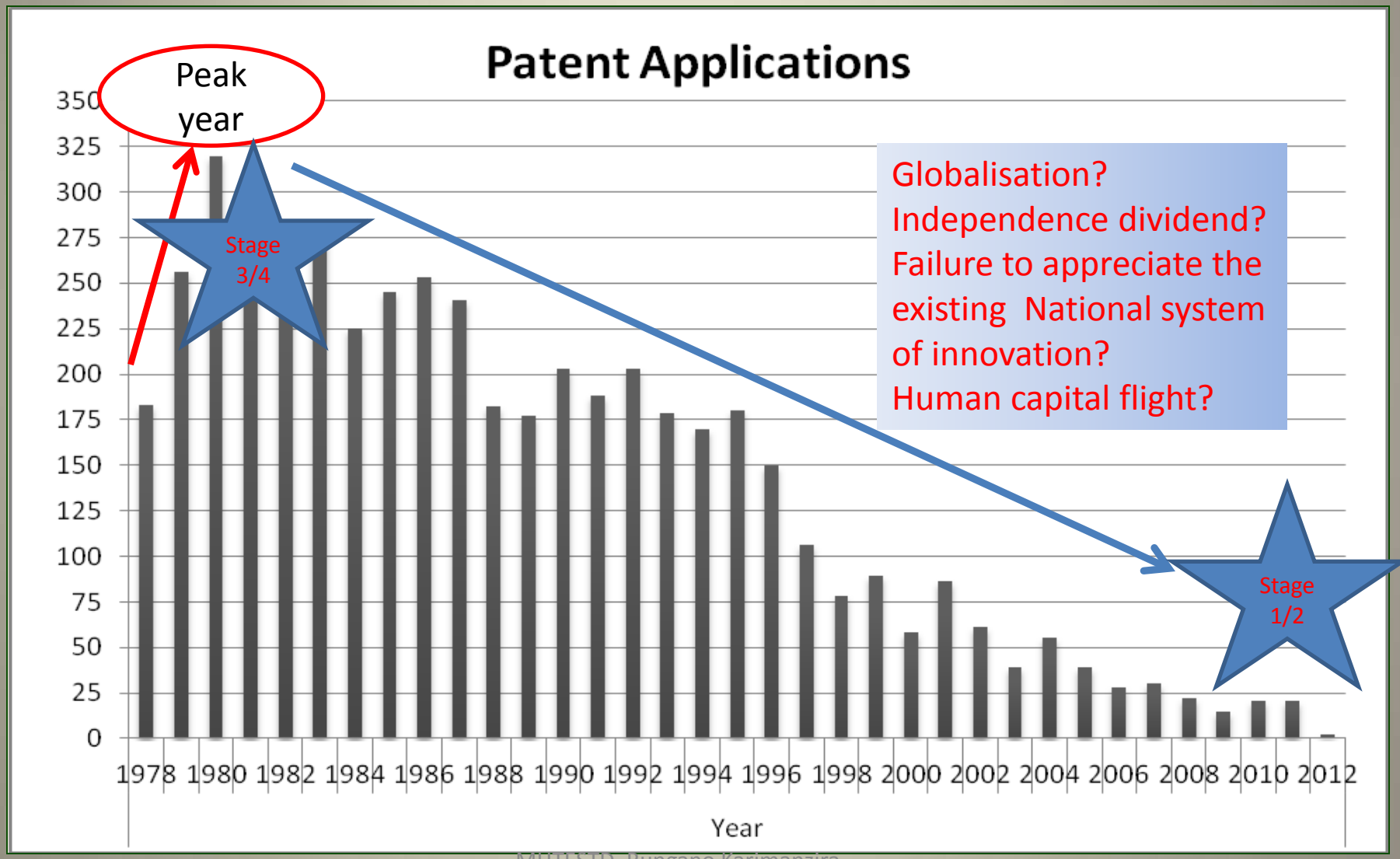

**National R&D Personnel Headcount Full Time Equivalents by Field of Science 2012**



# Distribution of graduates from the University of Zimbabwe (1980-2014)



# Zimbabwe Patent Statistics



# Zimbabwe Patent Statistics

| Year | Patent Application Category | Number |
|---|---|---|
| | National | 18 |
| 2011 | ARIPO | 0 |
| | PCT | 3 |
| | | |
| | National | 19 |
| 2012 | ARIPO | 4 |
| | PCT | 5 |
| | | |
| | National | 19 |
| 2013 | ARIPO | 6 |
| | PCT | 4 |

# SWOT analysis of Zimbabwe's IP generation platform

## Strengths

- Pioneering institutional background in Africa for research and innovation
- High literacy rate
- Well-developed education system
- Well-trained graduated students and scientists from within and abroad
- Good national infrastructure
- Abundant natural resources (minerals, flora and fauna)
- Generally keen environmental awareness
- Exemplary best practices at the University of Zimbabwe
- Multidisciplinary network of centres of excellence

## Weaknesses

- Fragility of governance indicators
- Absence of any explicit human resources policy for science and engineering
- Inadequate set of operational policy instruments to promote research and innovation
- Absence of centralized SETI policy formulation and coordination(NSI)
- Low research and innovation productivity
- A small SETI demand sector
- Indigenous knowledge remains largely disregarded

# SWOT analysis of Zimbabwe's IP generation platform

## Opportunities

- Human capital development in science and engineering
- Improve gender equality in science and Engineering
- Universities with SETI programmes
- National, regional and international collaboration
- Research and innovation funding agency
- Value-addition to abundant natural resources
- Improvement of infrastructure to support SETI activities

## Threats

- Low uptake and pass rate in science subjects
- High dependence on state funding
- Low participation of the business/enterprise sector in R&D
- Poor coordination, monitoring and evaluation
- An erratic energy supply is derailing progress in SETI
- Regional competition
- The wealth of SETI strategic priorities dilutes policy effectiveness

# National Responses

- Second Science and Technology Policy 2012
- Merging of STI and HTE
- Express mandate under the Department of Technology Transfer

# Department of Projects and Technology Transfer mandate

- To identify project driven technology transfer initiatives across all sectors;
- To Identify technologies in the public domain for applications within private and public institutions;
- To coordinate capacity building initiatives for effective transfer of technical know-how in targeted sectors;
- To advocate for exploitation of IP assets generated from R&D institutions by industries ( semblance of a Triple Helix);
- To develop statutes and institutional arrangements for the establishment of the NTTC &IH;
- To enter into mutually beneficial Partnerships/agreements with other countries and multilateral organizations and accede to S&T protocols in order to enhance Technology transfer.

# Proposed Agenda IP generation for development

- Define a clear agenda for a dynamic Science and Technology for Development through knowledge creation and IP generation.
- Resuscitate and strengthen the National System of Innovation responsive to National priorities.
- Strengthen human capital development in science and engineering in targeted sectors
- Provision of predictable, timely and adequate resources for Research and Development
- Improvement of infrastructure to support SETI activities in targeted sectors
- National, regional and international collaborative researches - trans-disciplinary approaches, co-design and co-production

# Summary

Scientific approach

- National System of Innovation – mutually supportive system of sector based researche
- Triple Helix ( R&D – Industry- Policy)
- Self sustaining Scientific development paradigm;
- Transition from developing to developed state

# I Thank You !
# Ndatenda!
# Siyabonga!
# Tumeshukuru sana!

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