A Policy Brief by ZIMYAS

Transforming research & innovation through human capital:

A roadmap to 2030

IMPRESSUM

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REVIEW

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Foreword

Transforming research and innovation human capital is crucial for Zimbabwe to become a global leader in addressing global challenges such as food insecurity, environmental degradation, biodiversity loss, climate change, and diseases. To meet Vision 2030, Zimbabwe needs to increase the number of researchers and adequately support them through private and public funds.

The Zimbabwe Young Academy of Sciences (ZimYAS) is an independent platform of outstanding scholars with expertise in research and innovation development. We are actively involved in advancing science, technology and innovation in Zimbabwe, South Africa, China, Namibia, the United Kingdom, and the United States of America. We form a critical part of Zimbabwe's research and innovation human capital development and financing:

- **Train**: provide research capacity building to young researchers based in local universities.
- **Retain**: recognize outstanding young researchers through merit-based awards.
- **Return**: Facilitate young Zimbabwean researchers abroad to participate in ZimYAS-led knowledge exchange programs.
- **Funding**: support young researchers in grant writing and facilitate their mobility regionally and internationally.

Executive Summary

In 2018, the Government of Zimbabwe set an ambitious socioeconomic development goal: Transforming Zimbabwe into an industrializing, knowledge-based upper middle-income country that provides a high quality of life to all its citizens by 2030. This means meeting all our social, economic, and environmental needs with cutting-edge knowledge and products generated by local private and public institutions.

Transforming research and innovation human capital is crucial for Zimbabwe to become a global leader in addressing global challenges such as food insecurity, environmental degradation, biodiversity loss, climate change, and diseases. The higher education sector is the linchpin of this effort since it already has mandate under Education 5.0 to train a workforce that can develop innovative and sustainable products.

As Zimbabwe Young Academy of Sciences identified, we identified four ways to transform research and innovation human capital development and financing.

Transform doctoral educational to facilitate training high numbers and high-quality students in local state universities.

Provide competitive remuneration, rewards, and recognition to retain highly skilled researchers who engage in world-class research in public and private sectors.

Attract Zimbabwean researchers abroad to return and participate in research and innovation programs in Zimbabwe.

Establish an independent National agency, National Research and Innovation Foundation, that provide research funds for research activities in the public and private sectors across all disciplines.

The fourth pillar is important: to meet Vision 2030, we must not be mere research and innovation consumers - we must become knowledge producers by funding our own basic and applied research.

R&D transformation is only possible if we have infrastructure for research and innovation financing and the manpower to develop novel ideas, processes, and products.

Vision 2030 and Sustainable Development Goals

Vision 2030 aligns with Sustainable Development Goal 9, which encourages countries to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

To achieve this, SDG 9 Target 5 was set, which recommended enhancing scientific research, upgrading technological capabilities of industrial sectors, and encouraging innovation by:

- ✓ Substantially increasing the number of research and innovation workers per million people.
- ✓ Substantially increasing research and innovation funding in public and private sectors.

SDG 9 supports developing people, processes, products, and knowledge required to meet all 17 SDGs. For that reason, to meet Vision 2030, Zimbabwe needs to increase the number of researchers and adequately support them through private and public funds.

Definitions and Concepts

According to UN Statistics:[1]

The term **researchers per million people** is a value that measures the number of research and development workers per 1 million people in a country.

Researchers are skilled professionals whose primary occupation is to conceive, create, adopt or adapt new knowledge, including software, instruments, processes, models, or theories.

Research and development (R&D) comprise creative and systematic work undertaken to increase the stock of knowledge–including knowledge of humankind, culture and society – and to devise new applications of available knowledge.

[1]https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+9.5.2

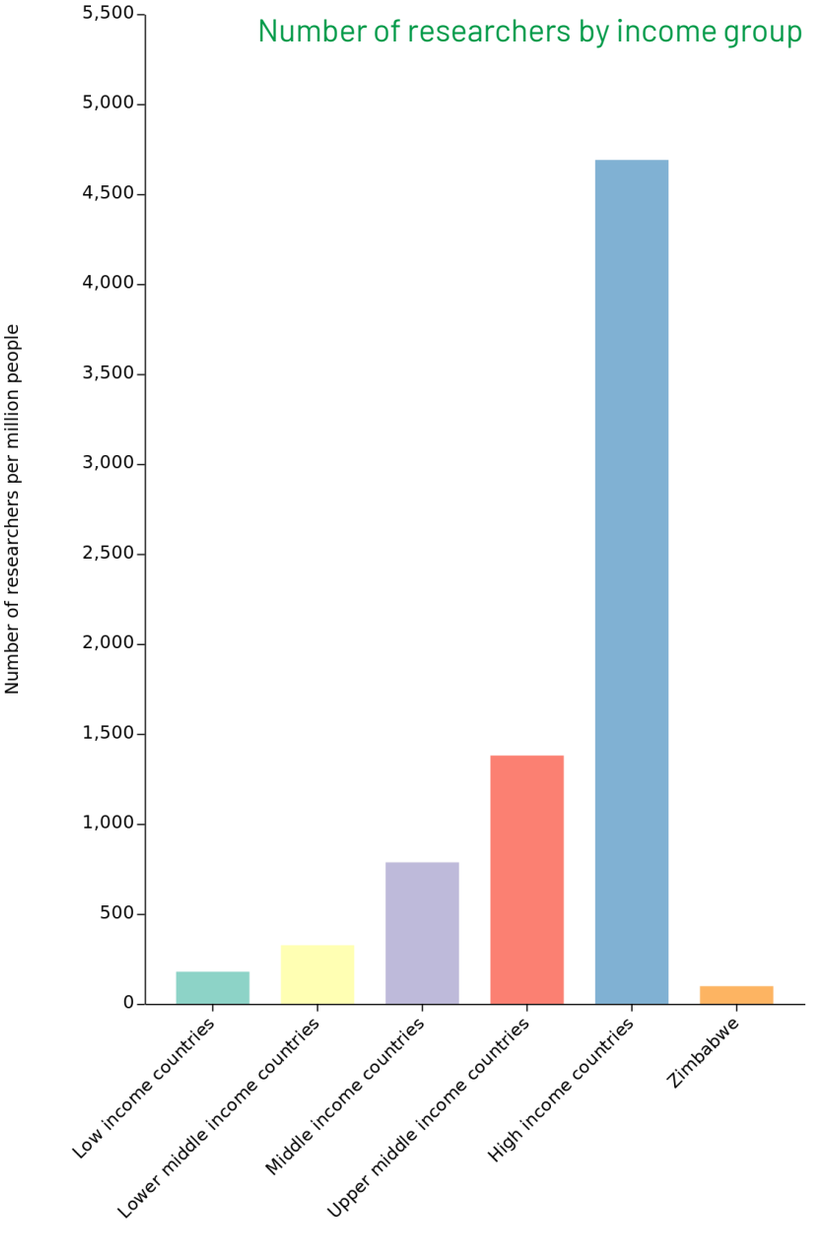
Shortage and Mass Exodus of Researchers in Zimbabwe

Researchers are essential for developing new processes and products required to address health, water, energy, and food challenges. Zimbabwe has a serious shortage of researchers, and this is partly due to a mass exodus of skilled workers.

UNESCO reported that there are 98 researchers per million people in Zimbabwe compared to a low-income country average of 178 and an upper-middle-income country average of 1,380.[2]

The World Health Organization reported that Zimbabwe has 0.2 researchers in the fields of health and medical sciences for every one million people, while Singapore has 1,158.

Upper middle-income countries have at least 100 health researchers per million people, while low-income countries have less than 10 health researchers per million people.



[2]http://data.uis.unesco.org

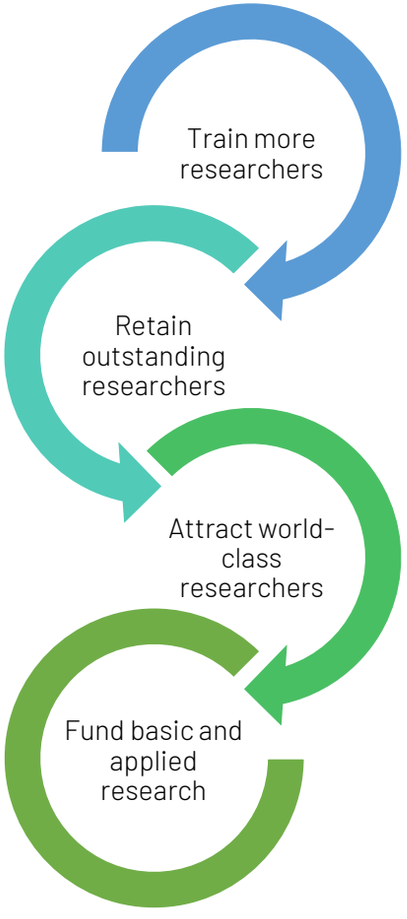
Policy Intents

We are releasing a new research and innovation human capital policy roadmap, informed by nearly a decade of experience as a major promoter of research excellence and cross-disciplinary collaboration among outstanding Zimbabwean scholars.

While the establishment of 12 state universities, innovation hubs at state universities, and the Education 5.0 mandate has put the prospect of transitioning from knowledge consumers to knowledge producers within reach, it remains challenging, slow, and uncertain without adequate support from public policies.

We are committed to working with stakeholders across private and public sectors to advocate for policies that accelerate increasing number of researchers and research funding in Zimbabwe.

4 Pillars of Research & Innovation Human Capital Transformation



Increase number of PhD holders to 20,000 by reforming doctoral education

Reward, recognize, and renumerate researchers competitively to reduce brain drain

Enact measures to attract Zimbabwean researchers abroad for short-term visits to permanent returns

Establish an independent agency for funding basic and applied research

Policy priorities for transforming research and innovation

The number of researchers per million people is 98; which is half the average in Africa and one tenth the global average. Our study showed that the number of researchers in Zimbabwe needs to be increased to at least 1,450 for Zimbabwe to develop innovative solutions that address the SDGs on its own. In other words, Zimbabwe urgently needs 20,000 more researchers across all disciplines.

Our policy roadmap identifies four key pillars — train more doctoral students, retain and empower current researchers, attract outstanding researchers, and fund basic and applied research — that policymakers should prioritize to accelerate transitioning from knowledge consumers to knowledge producers and build resilient and sustainable infrastructure to meet Vision 2030.

3.1 Train more doctoral students

Policies should support the promotion, transformation, and financing of doctoral education in state universities. These policies include doctoral quality standards, professional doctorate development in partnership with the private sector, formal training of doctoral supervisors, and measures for removing barriers to access to quality doctoral education among underrepresented groups.

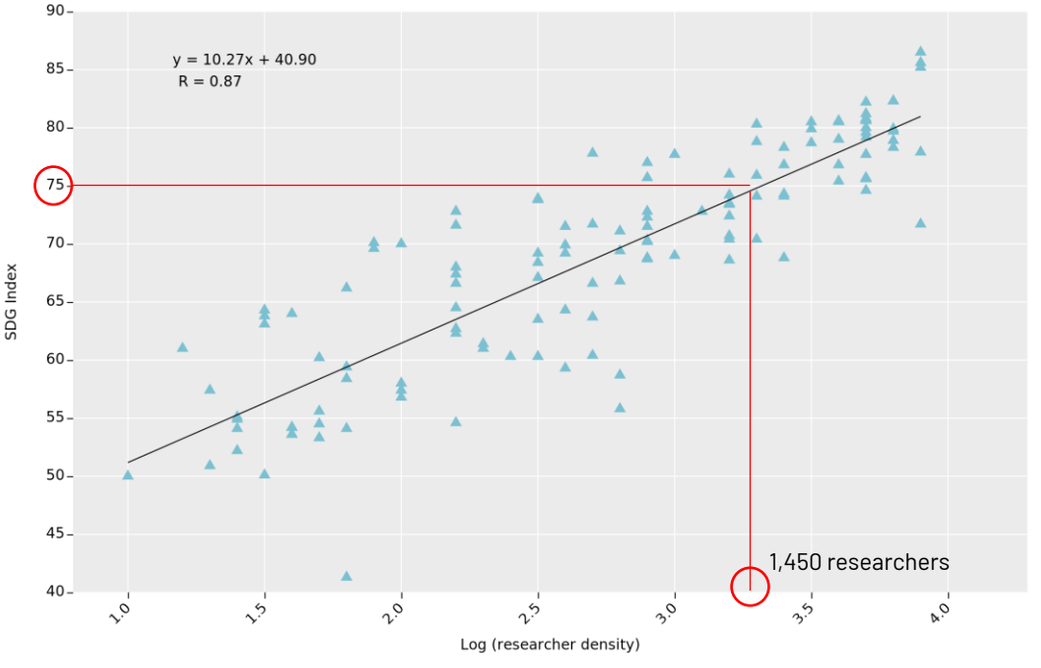


Figure 1. Relationship between SDG attainment and number of researchers per million inhabitants (Sanganyado et al., 2022)

3.2 Retaining and empowering current researchers

Brain drain has contributed to significant loss of critical skills in Zimbabwe. Besides increasing remuneration so that they can be competitive, at least within the region, policymakers should promote the recognition of local researchers for their expertise. National recognition of researchers will not only encourage research excellence, but it will also raise public interest in advanced research while opening a pipeline for future researchers.

There were 2,850 Zimbabweans studying for a PhD or on Optional Practical Training in South Africa and USA in 2020, which was more than twice the number of researchers currently working in Zimbabwe.

3.3 Attract outstanding researchers

Policymakers should develop programs that attract permanently, long-term, and short-term engagement of these researchers in research and innovation programs in Zimbabwe.

For example, policymakers can support the development of a program that attracts 1000 researchers who will receive a start-up research fund to train ten postgraduate research students in partnership with private sector over a six-year period.

Additionally, state universities appointments should be reformed to include visiting and honorary positions to attract outstanding Zimbabwean scholars who are interested in short-term and ongoing visits but not permanently returning.

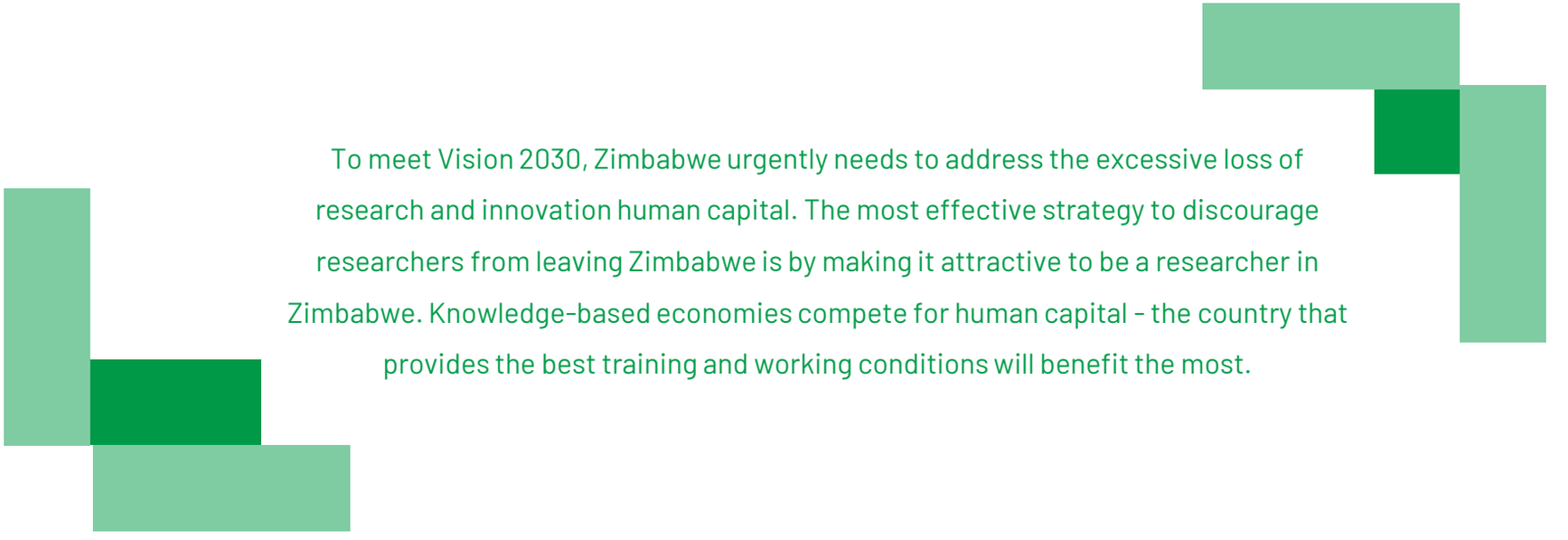
3.4 Fund basic and applied research

Policymakers should establish an independent agency tasked with financing and mapping the research and innovation strategies for Zimbabwe – the National Research and Innovation Foundation. The aim of the National Research and Innovation Foundation will be to develop innovative funding strategies, strengthen the research capacity of institutions and individuals, facilitate private-public partnerships, incentivize research and innovation in the private sector, and develop platforms for rewarding research excellence and connecting researchers to policy-makers.

What should policy makers do?

1. Train more researchers to increase of researchers per million people from 98 to 1,450 by 2027	
Recommendations	**Target stakeholders**
Develop a framework for Doctoral Degrees Qualification standards	Zimbabwe Council for Higher Education, Ministry of Higher and Tertiary education innovation Science and Technology Development, State and private universities, professional and learned societies
Establishing doctoral supervisor qualifications	Zimbabwe Council for Higher Education, Ministry of Higher and Tertiary education innovation Science and Technology Development, State and private universities
Training of supervisors	Zimbabwe Council for Higher Education, Ministry of Higher and Tertiary education innovation Science and Technology Development, State and private universities
Establish platform for industry-academia partnerships for doctoral training	Ministry of Higher and Tertiary education innovation Science and Technology Development, Ministry of Industry and Commerce, state and private universities, industries bodies

2. Retain and empower current researchers	
Recommendations	**Target stakeholders**
Improve working conditions for researchers in public or private sectors	Ministry of Higher and Tertiary education innovation Science and Technology Development, state and private universities, industries bodies
Provide remunerations that are competitive in high-middle income and high-income countries	Ministry of Higher and Tertiary education innovation Science and Technology Development, state and private universities, industries bodies
Offer staff development and research capacity-building opportunities, especially for women and other underrepresented groups	Ministry of Higher and Tertiary education innovation Science and Technology Development, state and private universities, industries bodies
Invest in world-class research facilities	Ministry of Higher and Tertiary education innovation Science and Technology Development, Ministry of Industry and Commerce, state and private universities, industries bodies



To meet Vision 2030, Zimbabwe urgently needs to address the excessive loss of research and innovation human capital. The most effective strategy to discourage researchers from leaving Zimbabwe is by making it attractive to be a researcher in Zimbabwe. Knowledge-based economies compete for human capital - the country that provides the best training and working conditions will benefit the most.

3. Attract outstanding researchers abroad	
Recommendations	**Target stakeholders**
Promote short-term visits by Zimbabweans abroad through formalizing honorary and visiting researcher or professor appointments	Ministry of Higher and Tertiary education innovation Science and Technology Development, state and private universities
Create a database of Zimbabwean researchers abroad highlighting disciplines of expertise	Ministry of Higher and Tertiary Education, Innovation, Science and Technology Development, state and private universities, learned societies, academies of science
Promote the permanent return of Zimbabweans abroad through competitive research start-up funds and housing and living allowance managed at the provincial or city level	Ministry of Higher and Tertiary Education, Innovation, Science and Technology Development, state and private universities, industries bodies, provinces, cities

The mobility of research and innovation personnel should not be stopped since it could benefit Zimbabwe. Meeting Vision 2030 requires viewing researchers abroad as knowledge bridges rather than lost knowledge. Hence, Zimbabwe needs policies that promote knowledge exchange between Zimbabwean researchers abroad and local research and innovation communities in both the private and public sectors.

4. Fund basic and applied research	
Recommendations	**Target stakeholders**
Establish an independent agency tasked with financing and mapping the research and innovation strategies for Zimbabwe	Ministry of Higher and Tertiary education innovation Science and Technology Development, state and private universities, industries bodies, learned societies, academies of science

Next Steps

ZIMYAS is committed to disseminating these recommendations to the target stakeholders, drawing on the young academy's expertise and those of the parent organization, the Zimbabwe Academy of Sciences.

It is anticipated that this policy brief and the corresponding research publications by ZIMYAS members will inform policymakers at the institutional, city, provincial, sectoral, and national levels. Evidence-based policymaking is imperative for Zimbabwe to meet the SDGs and Vision 2030.

ZIMYAS is open to partnerships with institutions and government departments interested in implementing the recommendations laid out in this policy brief. The partners will benefit from the knowledge and global experience of our members, who are outstanding researchers. Opportunities for working with the African Union and UNESCO will be pursued within the context of leveraging science, technology and innovation for social, economic, and environmental development.

Stakeholders interested in any aspects of this policy brief, particularly the implementation of the recommendations, must contact ZIMYAS at edmond@zimbabweyas.org or check our website https://www.zimbabweyas.org.

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He is an assistant professor in the Department of Applied Sciences at Northumbria University, United Kingdom. Before that, he was an associate professor at the Institute of Marine Science at Shantou University, China. He obtained his PhD at the University of California Riverside, USA and his BSc (Hons) at the National University of Science and Technology, Zimbabwe. He has written more than 50 research papers in reputable international peer review journals and sits on the editorial board of several journals, including Communications Earth & Environment and BMC Chemistry. He is a member of the Global Young Academy and a Fellow of the Institution of Environmental Science. More about his research and publications can be found here: https://www.northumbria.ac.uk/about-us/our-staff/s/edmond-sanganyado/

Zimbabwe Young Academy of Sciences promotes research excellence and cross-disciplinary collaboration between outstanding young scholars.

Zimbabwe Young Academy of Sciences is an independent, cross-disciplinary platform for outstanding young scholars in Zimbabwe and the Diaspora that seek to foster research excellence through scientific capacity building, promotion of interdisciplinary collaborations, and contributions to societal development.