



African students at the Lindau Nobel Laureate Meetings: At the Africa Outreach breakfast with Nobel Laureate Peter Agre (left) and during discussions

## Lindau Nobel Laureate Meetings

# Africa's Next Generation

## How to Support Africa's Science Structures

for Tomorrow's Best Young Scientists / by Wolfgang Huang and Stefan Kaufmann

Every year, the best young talents in sciences gather in Lindau, Germany, to meet with Nobel Laureates as well as their peers. 600 students and post-docs are chosen in a multi-stage selection process from all around the world for this once-in-a-lifetime experience. As participation from Africa was lagging behind for many years, the Africa Outreach Initiative under the patronage of former German Federal President Horst Köhler was started in 2015. Supported by the Robert Bosch Stiftung, the initiative helped to bring more than 150 excellent young African scientists to Lindau. In 2019, South Africa will be hosting the meeting's "International Day" – a highlight of Africa's presence at the Lindau Nobel Laureate Meetings.

With this in mind, we asked several Lindau Alumni as well as partners of this initiative about their thoughts on the current status of scientific excellence in Africa, what progress has been made, and what still needs to change.

### A Decade of Progress

While the situation greatly varies among African countries, the last decade has seen a considerable growth of scientific agencies, programmes, networks and conferences, and certainly an improvement of the situation.

To no one's surprise, South Africa is spearheading this development with its National Research Foundation, established almost 20 years ago. Current programmes such as the South African Research Chairs Initiative and the Centres of Excellence funding scheme contribute to keeping excellent scientists in Africa, says Roseanne Diab, Executive Officer of the Academy of Science of South Africa (ASSAf). But she also highlights various cross country-initiatives: "The African Institute for Mathematical Sciences (AIMS) is a pan-African network of centres of excellence for postgraduate education, research, and outreach in mathematical sciences established in 2003. This was followed

more recently by the AIMS Next Einstein Initiative, the goal of which is to build fifteen centres of excellence across Africa by 2023."

Most progress has been made in the area of health; all the more important as a bad public health situation has countless negative effects on people, economies and countries – and on science.

*There is a heroic effort to meet the Sustainable Development Goal #3 by 2030.*

Berhanu Abegaz

For example, between 2000 and 2015, the number of malaria deaths has decreased from an approximated 839,000 to 438,000: a decline by 48%. 90% of malaria infections occur in African countries.

SDG 3: "Ensure healthy lives and promote wellbeing for all at all ages"

### Challenging Structures and Attitudes

Yet, only 1% of global investment in R&D is spent in Africa, and the continent holds a tiny 0.1% share of the world's patents, as ASSAf's liaison officer Edith Shikumo points out. But money doesn't seem to make up the top priority on younger scientists' list of concerns. "I don't want to mention the usual obstacles like lack of proper infrastructure and expensive equipment; I would rather focus on the lack of tolerance for new and innovative ideas, the fear associated to out-of-the-box thinking and the tendency to avoid risk accompanying entrepreneurship are the main obstacles for a thriving science and research culture", says Ghada Bassioni, guest professor at the Technische Universität München and coordinator of Egypt-Germany collaboration, with the Science and Technology Development Fund of the Ministry of Higher Education and Scientific Research, Egypt – and Lindau Alumna.

Mark Williams-Wynn, who attended the Lindau Meetings in 2016 and is currently a post-doctoral fellow at the University of KwaZulu-Natal, adds: "One of the biggest obstacles that I have noticed is the tendency to avoid questioning the status quo. There is an attitude which exists not only among academic institutions, but throughout society: 'if it isn't broken, why fix it'. This applies not only to innovation, but also to how people go about their work."

*There is a lack of a desire to excel, and the aim of many people is to fulfil only the minimum requirements.*

Mark Williams-Wynn

"This lack to excel creates an obstacle to a thriving research culture, as not only is there a lack of innovation to be found, but there is little to no support for the commercialisation or further development of innovation."

But as Lydia Rhyman, affiliated at the University of Mauritius and the University of Johannesburg and a 2017 Lindau Alumna, points out, there is still more needed to create a thriving science environment, such as: (1) a mature, supportive leadership culture, (2) increased collaborative efforts, particularly south-south cooperations, (3) better access to infrastructures and equipment, (4) less PhD brain drain, (5) political and economic stability.

### Career Paths for Young Scientists

When asked about the availability of suitable, reliable career paths, everyone agrees that this is one of the major problems that limits progress and success of African research: Excellent young African PhD students are lured away by better conditions, more exciting science and more money, and due to the research structure situation, they may not be coming back. Of those who return, a large number chooses South Africa, where conditions are still the best. Plus, many are absorbed by industry, where they are lost from research fields, as Williams-Wynn observes.

*Pursuing a career in research can be daunting in Africa. Investment in young scientists is required so that Africa can come up with innovative solutions for its development.*

Lydia Rhyman

But there is hope, says Berhanu Abegaz, former executive director of the African Academy of Sciences: "There are many networks and organisations that are now available to help young people and to get them focused on African issues and also get them to stay in Africa." These include the African Academy's Affiliates program, the Next Einstein Forum, the AIMS, the Africa-Oxford Initiative, the Organisation for Women in Science for the Developing World, the African Women in Agricultural Research and Development, leadership academies, young academies, and others. Yet only a few African countries invest enough money in such structures and programmes.

### From Support to Cooperations

Some of the programmes mentioned have been initiated and funded by Northern countries, mainly Europe and the United States. However, Europe's history in the colonisation of Africa and the resulting sentiment that supporting Africa means paying an outstanding debt doesn't fit to a modern approach. Abegaz clarifies that "engagements will be beneficial to all parties if the driving philosophy is equitable partnerships. This would have to begin in the agenda setting stage and defining the basis of the partnerships. Some European partners like the Wellcome Trust accept, at least in principle, this approach."

Roseanne Diab adds another example: The Developing Excellence in Leadership, Training and Science (DELTA) Africa programme has already invested £60 million in training African researchers. Funding comes from the Wellcome Trust and the UK government, but the programme is led not from London, but from Nairobi, Kenya, by the Alliance for Accelerating Excellence in Science in Africa (AESA). By shifting the centre of gravity in this way, DELTA is beginning to ensure that science for Africa is led by Africa's researchers, and that it remains relevant to the needs of the continent.

Downsides of foreign partners are linked to research agendas being drawn by funders that do not serve Africa's interests nor research needs. As a consequence, more South-to-South partnerships need to be encouraged for Africa's development.

*We would want to see the role of other countries as equal partners and the investment in legacy projects that help to leave a tangible footprint by ensuring ownership by African countries and investments in its human capital.*

Roseanne Diab

In a shift of perspective and wording, it is no longer help that African countries are requesting, but partnership, explains Rhyman as she adds: "We African scientists cannot consider ourselves to be always in a position of requesting help from others, it is high time for us to wake up and work. For how long the support will continue? Why do they need to support us? When will we stand on our feet?"

*Wolfgang Huang is Director of the Executive Secretariat of the Lindau Nobel Laureate Meetings.*

*Stefan Kaufmann is Director at the Max Planck Institute for Infection Biology, Berlin. He was one of the scientific chairmen of the 2018 Lindau Meeting.*

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