

**DURING THE TWAS GENERAL CONFERENCE IN TIANJIN, HENERI A.M. DZINOTYIWEYI, (TWAS FELLOW 1988) AND ZIMBABWE'S MINISTER FOR SCIENCE AND TECHNOLOGY DEVELOPMENT, SPOKE ABOUT THE NEW COALITION GOVERNMENT'S PLANS TO ATTRACT ZIMBAWEAN SCIENTISTS BACK TO THEIR HOMELAND.**

*Zimbabwe is set to hold elections by June 2013 to end the power-sharing deal between long-standing president Robert Mugabe and recently inaugurated prime minister, Morgan Tsvangirai. Heading the Movement for Democratic Change (MDC), Tsvangirai marginally won the first round of the elections in 2009, but withdrew from the second round, letting Mugabe, representing the Zimbabwe African National Union – Patriotic Front (Zanu-PF), claim victory in that second round. This triggered a political crisis that led regional leaders to broker an agreement of all political parties represented in parliament and Zimbabwe's coalition Government of National Unity (GNU) was born.*

# CAUTIOUSLY OPTIMISTIC

*Zimbabwe's Minister of Science and Technology Development, Heneri Amos Murima Dzinotyiweyi, holds a doctorate in mathematics from the University of Aberdeen, UK, and has been full professor and dean at the University of Zimbabwe. In the mid 1990s he worked on a study of science and technology across the 14-state Southern African Development Community, returning to his post as professor of mathematics prior to his resignation to stand in the March 2008 elections.*

*After presenting “some challenges in science, technology and innovation (STI) development”, to the ministerial session of the TWAS conference, Dzinotyiweyi sat down with the TWAS Newsletter editor and elaborated the points he had raised.*

**W**hen I began my presentation on how science policy can contribute to improving the economy in Zimbabwe, I was being deliberately provocative. I said that talking about the gap between rich and poor means nothing unless we talk about employment. People must have jobs, the government must have an employment policy, otherwise our science, technology and innovation (STI) policies will be too distant to effect positive change on the poor. We first need to look at building the economy. How else will we have the money to put science policies into practice? This point is obvious, but it is not trivial.

When we meet at these TWAS conferences I think we must focus on understanding what is really happening – what is the driving force behind the issues in need of redress. As a mathe-

matician, I want to know what drives people to act the way they do. This leads me to the second point I wanted to emphasize, namely that poverty is only one of the problems we face in the developing world. The main problem is about life and death. Think about the conflicts taking place, for example. We need to ask ourselves, what are the STI solutions to problems like that?

Another provocative question: why have African countries generally made such little progress since independence and how can STI solve this? I have been a TWAS Fellow for 24 years, and I think that TWAS is in a privileged position to address this challenge.

In Zimbabwe, we had our Second Policy on Science, Technology and Innovation, jointly launched by the President, Robert Mugabe, and the Prime Minister, Morgan Tsvangirai. This is a Policy whose implementation is assigned to my ministry – the Ministry of Science and Technology Development. We also had the support of UNESCO in consultations held to formulate the Policy. Our vision – the Policy vision – is to integrate science and technology into both individual and national development. Hence even individuals must take stock and ask themselves, ‘what does science mean to me this year, next year...?’ in order to evaluate personal progress realized through science and technology contributions.

### ZIMBABWE CAN LEARN FROM CHINA

Extract from ‘Remarks by the prime minister of the Republic of Zimbabwe, the Right Honourable Morgan R. Tsvangirai, on the occasion of the launch of the Second Science, Technology and Innovation Policy, Harare International Conference Centre, Zimbabwe, 13 June 2012.

- *I have just returned from a successful visit to China at the invitation of the Chinese government. In my discussions with Premier Wen Jiabao and business executives from various corporations, it became clear that the success of China has been premised on sound policies that are science and technology oriented.*

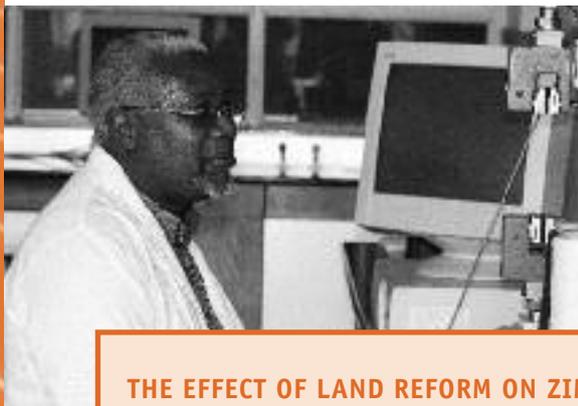
*The success of companies such as Huawei, a leading global ICT solutions provider, and Lenovo, show the emerging trend of the Chinese focus on technology and innovation. Indeed, science and technology have progressively become a catalyst for China’s economic growth.*

*Science, technology and innovation have the capacity to help the African Union’s vision of having at least 20 of its 54 member states attain middle income status by 2030, besides boosting the continent’s presence in published journals.*

*Zimbabwe must learn from such countries as China and India, which have invested several billions of dollars in science, technology and innovation development.*

*Today, those countries are the envy of many. These countries have developed to where they are today, not because they had plenty of resources, but simply because they maximized the benefits that they could acquire from the little resources they had through efficiency as a result of investment in technology.*





### THE EFFECT OF LAND REFORM ON ZIMBABWE'S ECONOMY

*Prior to 2000, farmers in Zimbabwe owned large tracts of land and could depend on economies of scale to raise capital, borrow money when necessary, and purchase mechanized equipment to increase productivity.*

*However, since the 'fast-track land reform programme' was introduced in 2000 there has been a steep drop in total farm output. Crops for export have suffered severely. Zimbabwe was the world's sixth largest producer of tobacco in 2001 but today produces less than a third of the amount produced in 2000, the lowest amount in 50 years. Zimbabwe was once so rich in agricultural produce that it was dubbed the 'bread basket' of Southern Africa, now it is struggling to feed its own population. About 45% of the population is considered malnourished.*

*Zimbabwean agriculture has undergone a huge structural change and some reductions in yield, particularly those due to decreased farm size, could be permanent. On the other hand, the number of smallholder farmers in tobacco has increased sharply and the output of tobacco, maize, and cotton is recovering, although yields are nowhere near their previous levels. According to a World Bank analysis, collectively these micro-entrepreneurs constitute one of the best performing sectors of the Zimbabwe economy.*

Our government has initiated some positive science and technology programmes. For instance, we have just opened a directorate for nanotechnology within the ministry and, under it, one of the projects we are funding is the 'Nano-Filter' water purification project based at Zimbabwe's National University of Science and Technology (NUST). We are contributing USD20,000 towards the development of a pilot plant that will purify water for rural communities, developing this very advanced technology but using locally available clay, in granular and powder form, which filters all known microbiological organisms in water, making it suitable for household use, including drinking. The Nano-Filter has been registered with the Zimbabwe patents office.

The government has also introduced an Innovation and Commercialization Fund (ICF), setting aside USD1.5 million in 2012 to be disbursed through the Ministry of Science and Technology Development on a competitive basis. In doing so, Zimbabwe is one of the few member states to follow the recommendations of the Common Market for Eastern and Southern Africa (COMESA) which met in Lusaka, Zambia, in June 2012.

The fund is used to support research on projects in areas like nanotechnology, energy, water and indigenous knowledge systems and technologies. Proposals can come from anyone but they are evaluated by an independent scientific committee. At the beginning of each year, we advertise for applications to this fund in local newspapers, and urge people in industry to pair up with researchers and institutes and collaborate in their proposals.

Through these ICF funded projects, we have identified a communication gap between entrepreneurs and researchers. Researchers tend to stay too much in the laboratory, and they don't engage with the outside world. So we're also organizing workshops on patenting for researchers to encourage more scientific contributions to come to the fore.

We do not lack clarity or determination. But we do desperately lack funds.

In Zimbabwe, the economic decline was primarily from about 2000. We lost massively on manpower and we know it.

Not surprisingly, many Zimbabweans left the country at that time – to overseas and South Africa in particular. It's a common joke in Zimbabwe that Zimbabweans run South Africa – they are so visible in many top South African positions.

The decline in the economy, triggered by the political situation, was severe over the period 2000 to 2008. Since 2009, the country has been in a process of rebuilding and adjusting to the new recovery programmes under the coalition government, the Government of National Unity (GNU). For instance, Zimbabwe converted to using the US dollar as currency and this has killed inflation and boosted the economy.

With regards to reversal of brain drain, we're focusing on two things. First, we need to encourage Zimbabweans who have left the country – and are scattered around the diaspora – to return, where possible. As a founding member of the eight-year-old Zimbabwe Academy of Sciences, I'm in a good position to use the academy's international contacts to establish links with Zimbabwean researchers now living elsewhere. We are encouraging these people to return but we know many won't until the economic situation improves and the institutions at home are in a position to enable them to continue their research should they return. This leads us to the second point of focus.

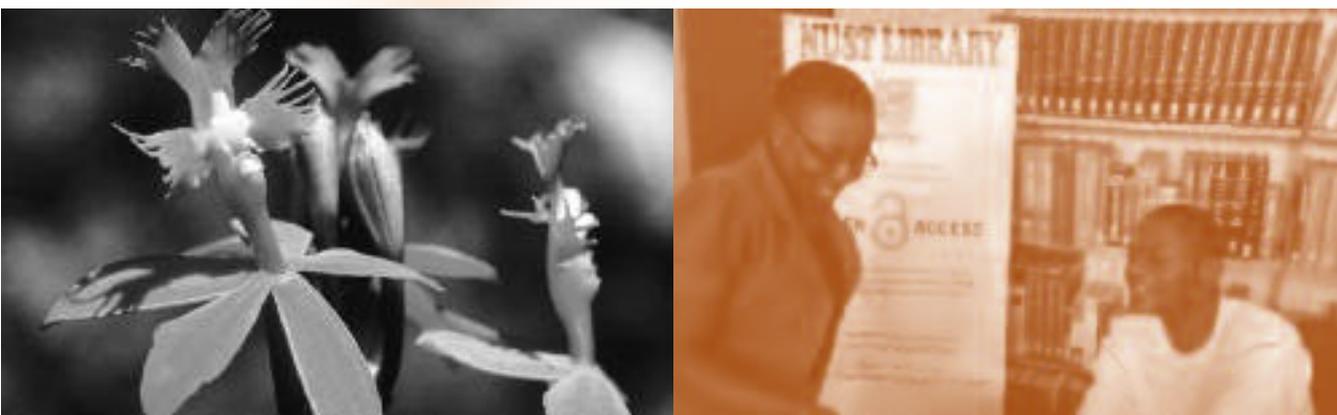


### TAPPING THE DIASPORA

Extract from Tsvangirai's speech to launch the Second Science, Technology and Innovation Policy

- *The implementation plan of the Science, Technology and Innovation Policy shall provide effective strategies for tapping into the diaspora. It is imperative that we institute ways to lure Zimbabwean scientists who are working in foreign lands back to the country to contribute to national development. Over the last ten years, this country has suffered a deficit of skilled and qualified personnel into the diaspora and these people will not be in a hurry to come back home at the rate needed to sustain our development. Therefore, corporate and academic institutions must rebuild the reservoir of skilled artisans, engineers and other disciplines to fill the void.*

Second, we need to improve the research capacity and quality of our institutions, and develop joint programmes with scholars and institutions outside Zimbabwe. That way, even Zimbabweans in the diaspora can begin to contribute to developments back home through collaboration with our institutions. However, even these modest programmes face constraints. The research and teaching capacity we have left here in Zimbabwe tends to be very low. Some



departments are really run down too far. There is inadequate funding for research. TWAS programmes are definitely helping in this area as universities are running postgraduate programmes with a minimal core of staff.

On top of this, the land reform actions have made many western countries respond negatively to Zimbabwe's calls for foreign direct investment.

In Sub-Saharan Africa, Zimbabwe used to be second in manufacturing only to South Africa. Now its economy is one of the bottom three, comparable to Lesotho and Swaziland. We import many things we used to produce locally. Before, we had a very rich agricultural sector including coffee, cotton, flowers, sunflowers, maize and tobacco – all contributing to exports. Since 2009, tobacco exports have been increasing annually but they are still not close to the 1990s peak, and exports in general are far below what the country needs.

### ADDING VALUE

Extract from Tsvangirai's speech to launch the Second Science, Technology and Innovation Policy

- *A challenge that has continued to affect our economy is the capacity to add value to our natural resources. This has made us net consumers of products developed from the very raw materials that we export to developed countries. The second Science, Technology and Innovation Policy is expected to result in a significant improvement in our national capacity to export finished products rather than primary goods that fetch very little on the international market.*

Zimbabwe was a British colony and, from those roots, whites owned most of the land. Then the government took most of the farms to settle the landless black majority in the land reforms. When the farmers left, most resettled black farmers did not have the skills or financial capacity and production went down.

People are not able to generate money and the banks don't have the money to lend. It's a vicious cycle that's destroying the economy. As I said, the starting point in developing any S&T policy has to be: where does the money come from?

The frustration is that, in Zimbabwe, there are people who understand what needs to be done but they can't do it.

You know, TWAS could really help here just by setting up a small team to drive a comprehensive independent analysis of the economy. An analysis to show where things are happening and where they are not happening – that would make the country more obliged to improve. ■