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COMMENT & ANALYSIS

DEVELOPMENT ■ BY JOHN MUGABE

Harnessing science and technology for progress

African nations must channel more funds towards research

After many decades of economic and social marginalisation, political instability and conflicts, over-dependence on the rest of the world for knowledge and finance, the African continent and its people are now even more determined to eradicate poverty and to become fully integrated into the global knowledge economy.

Indeed, science and technology can play a central role in meeting human development needs while maintaining the integrity of the natural environment. The real income gap between poor and rich countries is largely accounted for by differences in the accumulation and utilisation of science and technology. Closing this gap will require deliberate measures to build the scientific and technological capabilities of poor countries. In the past, African countries have done little to harness science and technology for their development. This is demonstrated by the continent's enormous development challenges, which are largely a result of seven factors.

Little attention

First, in most countries in Africa the links between scientific and political institutions are weak. Political organisations have not accorded science and technology much attention in their manifestos and parliamentary activities although the complex process of technological change is influenced by many political factors. There is a need to build strong political constituencies for science and technology development in Africa.

Second, most African countries formulated their science and technology policies in the 1970s and 1980s when development imperatives and technological opportunities were difficult, so that many of these policies focused on organisational rather than on programmatic issues. In recent years, countries have been preoccupied with creating commissions or secretariats to promote science and technology, and have paid little attention to the long-term programmatic aspects of science and technology development.

Though governments have setup administrative functions for science and technology, they have failed to put in place the necessary programmes to anticipate and respond to emerging developments. Third, African countries have devoted too little, and in many cases declining, funding to Research and Development. Most spend less than 0.5 percent of their GDP on research and development. This is so despite the declaration in the Lagos Plan of Action and in national science and technology policies that each country would allocate at least one percent of its GDP to research and development activities.

In agriculture, research and development funding has declined dramatically in the last decade or so, to the extent that the region's ability to achieve and sustain food security is being impaired. The low and declining expenditures on research and development are a clear indication of the low priority that countries have given to science and technology. Fourth, associated with the above three factors, the quality of science and engineering education is declining at all levels in Africa. Student enrolment in science and engineering subjects at primary, secondary and tertiary levels are also falling.

In agriculture, research and development funding has declined dramatically in the last decade

These developments undermine the continent's aspiration to build up its numbers of scientists, engineers and technicians.

Fifth, Africa is losing some of its best scientific and technical expertise to other regions of the world. Growing numbers of African scientists and technicians are joining this brain drain, leaving the continent to work abroad for a variety of reasons including inadequate research infrastructures and poor remuneration packages. While other regions, particularly Asia, have developed and adopted strategies to mobilise and utilise their diaspora, Africa has not. The region can no longer afford to ignore this human capital – it needs to design ways to tap and use the enormous range of talents of Africans abroad for its own scientific and technological development.

Sixth, a further challenge faced by African countries relates to strengthening and/or building institutions dedicated to scientific and technological innovation. As a result the research and development institutions in many countries are getting weaker. Most countries have not organised and mobilized their institutions in such ways to utilise their scarce financial and human resources in specific fields of science and technology. They have tended to spread their

resources too thinly across the institutional terrain. As a result, the region has a whole has not been able to grow 'centres of excellence' in such areas as biotechnology, space science and information, communication and technology. Seventh, the links between public research and development institutions and private industry are generally weak.

There is a mismatch between research and development activities and national industrial development goals and strategies. For example, while the industrialisation policies of most African countries have emphasized building and strengthening SMEs, the links between these enterprises and research and development institutions are weak. African policy makers and politicians have recognised that the barriers to the continent's scientific and technological development need to be removed if Nepad's goals are to be realised.

Mr Mugabe is the Secretary to the African Ministerial Council on Science and Technology of the NEPAD. This commentary is derived from a chapter in Dialogues at the Interface: Science and Technology Policy for Development, edited by Louk Box and Rutger Engelhard (Netherlands Ministry of Foreign Affairs/Directorate General for Development Cooperation, 2005).

