

THE IMPORTANCE OF SCIENCE, TECHNOLOGY AND INNOVATION FOR TANZANIA

PRESENTATION TO THE 2009 GLOBAL FORUM ON STI CAPACITY BUILDING PARTNERSHIPS FOR SUSTAINABLE DEVELOPMENT

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Distinguished Participants Ladies and Gentlemen

1. We all acknowledge that Science, Technology and Innovation are the paramount driving force for socio-economic development of human civilization. They have become a major force towards gaining competitive advantage in many societies, Tanzania being one of them. Technological developments and the application of Information and Communication Technologies (ICT) as well as the use of new energy sources have created great opportunities for socio-economic development. Scientific knowledge has led to remarkable innovations that have been of great benefit to humankind. However, most developing countries have not been able to fully exploit the potentials of the recent advances in Science, Technology and Innovation due low investment. As a result, technology development has mostly contributed in widening the gap between the developed and developing countries. The key characteristic of this phenomenon is that richest countries encompassing only 20% of the world's population receive about 85% of the total global income, while the poorest countries with the poorest 80% of the population receive only 1.4% of the total global income.

2. Distinguished Participants, Ladies and Gentlemen

Globalisation which, of recent times, has been accelerated by the revolution in the application of ICT, allowing for easier access to knowledge for development, has further exaggerated the socio-economic inequity and the digital divide. There is, therefore, an urgent need to take measures to bridge the ever widening Science, Technology and Innovation as well as the Information and Communication Technology gap. Without such measures, globalisation will continue to build lamentable, unacceptable and unethical disparity among the citizens of the world.

Tanzania has a population of about 40 million people with increase of 3% annually. Economic growth is 7% with less impact on poverty reduction. 70% of population is under thirty years old. Under five mortality decreased from 147 per 1000 live births in 1999 to 91 in 2007. Newborn and Maternal mortality remain high. 75% of population lives in rural areas and more than 80% depend on subsistence farming. Agriculture contributes 25% of GDP with growth of 4% due to low productivity, post harvest losses²⁵ and little value addition. Other sectors which contribute to GDP include Services 48% (communication is the fastest growing services), Manufacturing 9.4%, Construction 6.7%, mining 2.6% and fishing 1.5%. On energy consumption patterns 90% depend on biomass, 7% oil and gas, 2% of rural population access electricity from national grid. Less than 1% use coal, solar and wind. Environmental challenges include desertification, climate change, and pollution. Access to clean water and sanitation is still low. There is significant progress in education enrollment rate in primary, secondary and tertiary level.

Science and Technology may facilitate the achievement of Millennium Development Goals through sustained and enhanced economic growth; provide employment opportunities; enhance market efficiency; tackle population growth issues; climate change and environmental degradation.

▲ Tanzania is endowed with a great abundance of natural resources, and is one of the first few countries in Africa that implemented

UNESCO's recommendation of the 1960's to establish the Tanzania National Scientific Research Council that was established in 1972. However, it was not until 1985 when a National Science and Technology Policy was adopted. Thereafter, a series of institutional reforms and other events have been taken by the Government that include:

- 1986 Transformation of the National research Council into a fully established Tanzania Commission of Science and Technology (COSTECH);
- 1990 The establishment of the Ministry responsible for Science, Technology and Higher Education;
- 1996 A review of the National Science and Technology Policy of 1985;
- 2003 The publication of the Science and Technology Sub- Master Plan (2002 – 2017) by the then Ministry of Science, Technology and Higher Education;
- 2008 Establishment of the Ministry of Communication, Science and Technology by the Government Instrument of February 2008.

3. Distinguished Participants, Ladies and Gentlemen

Over all those years, however, a successful implementation of its strategic plan^s has remained elusive, mainly due to resource constraints. Tanzania's expenditure ~~is~~ on Science and Technology has remained low reaching only 0.028% of her GDP as compared to the African Union (AU) recommended minimum for every Member State, 1% of the GDP. Tanzania, like many other developing countries of sub Sahara Africa, therefore still faces many challenges in ensuring that knowledge, STI and products thereof, that is new and improved products, processes and techniques contribute most significantly and positively to the country's economic development and competitiveness.

The Department of Science and Technology has existed within the Ministry responsible for Science and Technology since its establishment. All matters pertaining to science and technology are coordinated by the Divisional Director of Science and

Technology. Specifically, this division is responsible for formulation, review, monitoring and evaluation of science and technology policies in the country.

Currently the Ministry is in the process of reviewing the 1996 National Science and Technology Policy to formulate the National Science, Technology and Innovation (STI) Policy. The National Research Policy is also in the process of being formulated and the Government has committed itself to increase the amount of local funding for STI and research and development programmes in order to progressively attain the recommended minimum level of 1% of the GDP at the earliest possible time. The National Biotechnology Policy and the national ICT Policy are in existence.

4. Distinguished Participants, Ladies and Gentlemen

The on going STI related initiatives in Tanzania include:

a) The National Science, Technology and Innovation Systems Review initiative

The Government of United Republic of Tanzania with the assistance of UNESCO has embarked on a process of reviewing the National System of Innovation with the objective of developing a Plan of Action in the area of Science, Technology and Innovation that will facilitate STI integration in the country's socio-economic Development. UNESCO is expected to catalyze this multi-donor activity to conduct an international review of Tanzania national systems of innovation, using a tested methodology which has been successfully applied in major countries such as the People's Republic of China, South Africa and, most recently, Chile.

The main Thrust of the Tanzania's National Innovation Systems Reform Project and Process is to provide a broad Science, Technology and Innovation Framework for future competitive and sustainable growth of Tanzania's economy to ultimately improve

quality of life of the vast majority of the people in Tanzania; build and foster local capacities for sustainable growth. The project is designed to provide assistance to the Government of United Republic of Tanzania in a pre-investment analysis of the performance of her Science and Technology Policies, Programmes and Institutions in the country with a view of identifying measures to revitalize and reposition the science, technology and Innovation systems and increase its effectiveness in meeting society needs particularly to economic competitiveness.

b) The establishment of the Nelson Mandela Institute of Science and Technology

The Government of United Republic of Tanzania has also accepted the offer given by the advisory body of the Nelson Mandela African Institute of Science and Technology (NM-AIST) to host one of the four campuses in sub-Saharan Africa that will offer academic programmes with a focus on education and research in science and engineering in order to train future leaders, researchers and entrepreneurs. NM-AIST Arusha campus starting next academic year will attract the best and brightest faculty and students, selected on merit alone within PANAFRICAN member Countries. Other campus of NM-AIST include the Abuja Campus for the Western region, the Ouagadougou campus for Central Africa and The Cape Town campus in South Africa. The goal of AIST is to catalyze development of world-class science, engineering and technology through the production of high-quality scientists and engineers in Africa to stimulate economic growth and employment.

c) The establishment of the Life Sciences convergence centre

The Government of United Republic of Tanzania in collaboration with the McLaughlin-Rotman Centre (MRC) for Global Health at the University Health Network and University of Toronto (Canada) are in the process of establishing the Life Sciences Convergence Centre which is expected to strengthen its health innovation system and, in particular, commercialize health biotechnology products. The proposed Convergence Centre will function as a non-profit neutral entity that will co-locate science, business and capital providers for

the very first time in Tanzania to enhance the commercialization of life science-related technologies. It will support the growth of early-stage biotech companies by allowing them to advance promising proprietary candidates. The Centre will focus on life science technologies including health, agriculture, fisheries and livestock, wildlife and forestry, and life science-related information communications technologies, though initial efforts will be focused on health technologies holding the greatest promise for social and commercial impact. Comprised of both a **Physical Centre** located in Dar es Salaam in the vicinity of the Muhimbili University teaching hospital and a **Virtual Platform**, the Convergence Centre will be a vehicle to accelerate technologies from pre-commercialization phase through development.

d) The Centre of Excellence in Agricultural Biotechnology (NABC)

The Government of URT is to establish the National Agricultural Biotechnology Centre (NABC) at Sokoine University of Agriculture (SUA) as a national centre of excellence in agricultural biotechnology, with the aim of invigorating the process of agricultural transformation in the country. The main objective of NABC is to implement a rationalized, effective and relevant agricultural biotechnology research for development with the end view of knowledge building and generating improved agricultural technologies and products with enhanced value. The establishment of NABC will start by making use of existing human and infrastructural resources available at SUA. However, the human and infrastructural resources will require strengthening in order to fully realize the vision and mission of NABC. The expected outputs include: enhanced national capacity on agricultural biotechnology; developed and commercialized products and processes derived from biotechnology; forged collaborations with national and international R&D partners.

e) *The awards for best female student in Science at Secondary and Tertiary education level*

In order to encourage more female students to opt for Science programmes at secondary and tertiary level, the government, through the Minister's Awards has been giving prizes and certificates to female best performers in science and technology related subjects starting with ordinary level, Advanced level, and Higher Learning Institutions since 2002. Starting 2009 the Awards have been extended to cover both female and male best performers in science and technology subjects taking into consideration the declining interest in science subjects even for male students.

5. Distinguished Participants, Ladies and Gentlemen,

Some of the Main challenges to STI development in Tanzania and Africa in general include:

- Resource*
- Human capital capacity development;
 - Inadequate resource allocation for financing STI activities;
 - Coordination of research and transformation of research findings into products for solving the socio-economic problems facing Tanzania;
 - Lack of entrepreneurs and business and capital providers prepared to invest in Science, Technology, and Innovation;
 - Lack of public awareness on STI reforms;
 - Declining interest of the youths in Science and Technology programmes.

6. Distinguished Participants, Ladies and Gentlemen,

This forum provides an opportunity to share experiences and deliberate on issues of partnership for capacity building for science, technology and innovation. The key principals of partnership should be based on mutual trust, respect and provide opportunity for countries to decide what is best for its people.

In conclusion, it is apparent that much still remains to be done in order to harness STI for socio-economic development in Sub-Saharan Africa. We need to ensure that the importance of science features prominently in our discussions at country level within the context of general budget support and sector support programmes based on Paris Principles. I congratulate the World Bank development partners and other agencies for coming up with this important and timely initiative in order to promote sustainable development.

Principles

I THANK YOU FOR YOUR ATTENTION