

TECHNOPOLICY BRIEF 7

HOW CAN SCIENCE AND TECHNOLOGY
IN AFRICA BE FORMULATED AND
IMPLEMENTED?

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AFRICAN TECHNOLOGY POLICY STUDIES NETWORK

ABOUT THE AFRICAN TECHNOLOGY POLICY STUDIES NETWORK

The African Technology Policy Studies Network (ATPS) is a multi-disciplinary network of researchers, policy makers, actors in the private sector and other end-users interested in generating, promoting and strengthening innovative science and technology policies in Africa. With a regional secretariat in Nairobi, the network operates through national chapters in 21 African countries, with an expansion plan to cover the entire sub-Saharan Africa.

One of the objectives of the network is to disseminate research results to policy makers, legislators, the organized private sector, civil society, mass media and farmers' groups through publications, dialogue and advocacy. Among its range of publications are the Working Paper Series (WPS), Research Paper Series (RPS), Special Paper Series (SPS) and the Technopolicy Briefs.

Technopolicy Briefs Series are commissioned short papers written by experts from all over the world specifically to address current science and technology policy concerns and questions in Africa. The briefs are also summaries of technical papers published under our WPS, SPS and RPS written to highlight significant policy recommendations. These briefs are written with the busy policymakers and non-specialists in mind. The materials are designed for general readership and help advance the advocacy and knowledge brokerage roles of the ATPS.

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1.0

Introduction

It is no longer in doubt that science and technology is the engine for growth. There is a consensus here. There is an equally strong understanding that without appropriate science and technology (S&T) policy to anchor and support the economic policies, the economic recovery and renaissance in Africa will be weak at best. Unfortunately, in spite of this understanding and consensus, science and technology policy does not command as much of our attention as it should. We have ministries of science and technology, national councils for science and technology and other S&T policy agencies in Africa that are under-funded and ill-equipped to execute their mandates. Often, the mandates of these institutions and their relationship with other organs of government are not clearly defined, and the national leadership fails to provide it with a rallying cause.

S&T policy, by its very nature, emanates from various ministries: education, health, agriculture, industry, water resources, planning and national development. This, sometimes, gives the impression that a lot is being done and that a coordinated approach will be superfluous. But S&T policy is too important to be incidental. It must be purposeful, coordinated and directed towards achieving stated sectoral or national goal. What is, therefore, the best strategy for generating and implementing an enabling S&T policy for economic development of any nation in Africa? Before we deal with this question let us examine the environment for economic policy formulation, since S&T policy should be formulated in support of the overall economic and developmental goals.

2.0

What is the Ideal S&T and Liberal Economic Environment?

In this era of economic liberalism and market fundamentalism, S&T policy, just like industrial policy, may be seen as an intrusion in the market. In the strict sense of market determinism, industrial development does not require the guiding hand of the government. Once the government has provided the enabling environment, industrial growth will follow. But this is farther from the truth. Not even the most developed industrialized nations have left the market to determine their industrial trajectory and growth. It may not be called a technology or industrial policy, but these governments took and continue to take active steps to engineer, promote and support the development of certain industrial products or sectors. This is done through support for certain types of research, through externalizing the product of military-industrial research, export guarantee, material and legislative support for innovation and other economic measures including subsidies intended to promote certain products and sectors. For instance, a country may not have a specific science, technology or industrial policy towards the production of certain types of automobile but uses public resources to support research and development consortium in a particular university for the purpose of supporting the automobile industry. This is technology and industrial policy by other means.

In the era of privatization and economic liberalization, African countries must be careful not to allow these policies to negate the need for a well-thought out S&T policy. It is critical that economic policies in all their ramifications are scrutinized for its compatibility with a nation's given or identified technological trajectory. Growth, empowerment, and wealth creation should not be promoted and then followed by blind privatization. Privatization should be undertaken under conditions that allow the upgrading of skills and learning, for increased domestic content in the intended production, for knowledge transfer. Joint ventures and foreign direct investment (FDI) should not be promoted without examining these factors and without due consideration for technological capability building and the overall impact on poverty



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reduction. It, therefore, means that one has to privatize and sign joint venture agreements with a purposeful technological ideology in mind. This ideology does not leave things to chance, but provides the framework for enacting and implementing policies for technological capability acquisition in support of economic growth and development.

How then do we establish this trajectory and whose role is it to ensure compatibility with economic policies?

Technology-led development is a leadership endeavor. This is true for a developing country much more than for a developed country. Leadership endeavor implies that the leader shows keen interest in using S&T to advance economic development and takes personal interest in selected key sectors and activities where the country has either static or dynamic comparative advantage. The leadership role will include providing material support but more importantly, it will mean personal demonstration of interest from the President or his direct appointee that the work of the scientists is important. The recent visit of President Mwai Kibaki, the President of Kenya, to the Kenya Agricultural Research Institute (KARI) greenhouse for the application of biotechnology in maize is instructive. The President must stay interested, pay unannounced visits and ask for results. Nothing will motivate the researchers much more than this.

3.0

Does the Nature of the S&T Coordinating in Institution Matter?

What is the best strategy for generating the policies?

Whose role is it to ensure compatibility with economic policies? The two questions are related. First, S&T policy must fit into and must drive an overarching developmental goal(s). These goals may be expressed, as in Kenya and most other Africa countries, in their economic recovery/ strategic plans. It can also be sectorally focused. What is important is that an S&T plan must be elaborated to provide the engine for sustaining the process of achieving the stated economic and social goals. In essence, an S&T policy should not be elaborated in a vacuum. Second, an S&T policy should be elaborated within the framework of national systems of innovation, that takes a holistic rather than a partial view of the economy, the interconnectedness of the sectors, identifies the role of the different actors and seeks to fill the gaps in the system will produce a superior result.

Let's look at two examples of industrial policy pronouncement, one real and another imagined. President Olusegun Obasanjo, the President of Nigeria, has banned the importation of furniture into Nigeria and I imagined that President Kibaki would like Kenya to be the leading exporter of textile in Africa. As an S&T policy person, I would pose the following questions and seek answers to them.

- How do we produce cheap, high quality cotton/silk/wool in large quantities?
 - Do we need biotechnology?
- Do we have the right technical competencies and skills for example in yarning, dyeing, machine and maintenance and repair?
- What is the status of our technological capability, Do we have the necessary equipment/processing plants?
- If the skills/technology is lacking, how do we acquire it?
 - Technology transfers
 - Technology licensing



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- Hire technical expertise
- Training: both local and abroad
- Can we institute programs in our universities/polytechnics to generate our own crop of textile engineers, technologists and designers?
- Do we need a research institute/foundation dedicated to textiles e.g. "Textile Research Foundation"
- Do we need science/industrial parks and incubators? And how do we link the outcome of incubation to commercialization e.g. through EPZ?
- How do we ensure that the whole system is linked and the actors understand their roles? How do we promote continuous learning within the system?

The questions cut across sectors and will involve different actors. But they are all very important questions. Within a purely "economistic" paradigm, these questions would not be asked. And without answers to these questions, the attainment of the stated goals will not only be delayed, it may never in fact materialize. Even if it materializes, it will not be robust enough to stand the test of time. Make no mistake about it, the issues will not be resolved as a result of the market forces. It requires active government policy intervention. While production and innovation take place in the private sector, it is the role of the government to provide the support mechanisms that ensures sustainability in the production process especially if new ideas and new processes are involved. From this it follows that there must be an institution, a sub-department for S&T policy planning placed perhaps under the Ministry of National Planning. These S&T policy experts would be the natural ally of their economic policy counterparts with a wide mandate to provide S&T policy inputs into national and sectoral policies. The National Science Council can also play this role. But it has to be given greater recognition and brought into the mainstream of things.

From the foregoing, we learn that national leadership and stated national economic and social goals should catalyze a set of S&T policies which create the foundation, the building blocks, for attaining these goals. The national system of innovation allows us to have a clearer picture of what is required and how to address the requirements. There is absolutely no magic in this business. Investment in the right education, in technological capability and purposeful and creative leadership are all necessary conditions for success. The discussion today on science and



technology parks are extremely important. Technology parks form one of the building blocks in the system. But we must ask fundamentally what the parks would be used for and to which overarching goal (s) are they related. It can only help us if we know what to encourage and what to discourage given Africa's meager resources.

At ATPS we keep all of these issues in view and provide the platform for debate, for innovative approaches to resolving S&T issues. More importantly, we try to engage the government and other stakeholders to understand the importance S&T and the associated policies as the foundation for economic recovery, growth and development.

The author is the Executive Director of African Technology Policy Studies Network (ATPS). This policy brief is based on a speech delivered on the occasion of the African Scientific Revival Day, commemorated with a Kenyan National Workshop on Science and technology Parks Development for Sustainable Industrial Growth. Views expressed in this brief are personal.

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