Innovation and Impact – Fostering New Partnerships to Facilitate Africa’s Development

A Partners Forum hosted by the African Science Academy Development Initiative (ASADI) of The National Academies (USNAS), the National Research Foundation (NRF) of South Africa, and the Carnegie Corporation of New York

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Background and context
African leaders in government, business, science, higher education, and civil society are seeking fresh and bold evidence-informed approaches that can move the African continent forward towards its full potential. Political support and resources have been committed, and important coordinating mechanisms for action have been launched.

The Science, Technology and Innovation Strategy for Africa 2024 (STI Strategy 2024) takes into consideration the tremendous social, economic, and technological progress Africa has made over the last decade, driven by a number of key factors. These include increased domestic and Foreign Direct Investment (FDI), improved international market prices for Africa’s export commodities, strong interest by African students and graduates in entrepreneurship, rapid uptake of ICT and increased peace and stability. Africa’s share of the global economy (gross domestic product) has grown from an average of about 1.9% to 2.7% between 2000 and 2011. At this rate, Africa has a chance to once again achieve the average 3.3% share of global GDP attained between 1974 and 1985 in the next decade.

There is growing optimism that Africa will become a driver of future global economic growth, but increased measures are needed to enable the continent to leverage unprecedented advances in scientific discoveries and new technologies to address its political, socio-economic, and development challenges. Opportunities exist to create enabling environments that will allow the enormous number of young people in Africa to unleash their social, economic, cultural, and intellectual potential and engage more fully in contributing to Africa’s development into a knowledge and evidence-driven economy.

Central to achieving these goals will be appropriate levels of strategic and technological research and skilled human capital to render Africa self-sufficient and, indeed, globally competitive in the modern day knowledge market. The AU has, however, noted “a dearth of capacity at all levels” that threatens the continent’s capacity to address its socio-economic priorities. Rather than simply proposing greater levels of existing skills training measures, the AU calls for a deepened capacity for systemic analysis of the continent’s priorities and deficiencies, and for innovative and sustainable solutions to be generated. Even the flagship universities on the continent often lack the requisite critical mass to achieve this vision. It is thus not insignificant that the AU’s Agenda 2063 calls for a significant increase in the number of PhDs on the continent and greater investment in science and technology.

In addition to this, to be globally competitive – particularly in the natural sciences – researchers need access to large and expensive equipment that is unlikely to be available at every university, or even in every country. Sharing such resources is not only efficient, but enables the growth of research in institutions in countries that would not otherwise be able to engage in these fields of study. In this context, the AU calls for “African countries and institutions to optimally maximize existing capacities” and for
“innovative mechanisms to build upon and pool existing capacities across required levels and on an inter-
regional basis” (AU, 2012).

**Transformative change**

The need for transformative change to ensure competitive success is widely recognized by various strategic initiatives and prominent voices from within and outside Africa. Many mechanisms are proposed, with varying forms of horizontal linkages across the science and technology innovation system. Not surprisingly, capacity-strengthening initiatives are at the center of most.

It should be recognized that transformation can be achieved through grand plans as well as incremental change, as long as key levers or potential tipping points are identified. Interventions can be structured around such strategic areas.

Transformative change is usually more or less unexpected, often achieved through key “levers” and sometimes through hard-to-predict tipping points. It tends toward the multidisciplinary and holistic, integrating a range of strategies that focus on people’s beliefs, values, and attitudes. Strategies may also focus upon individual behaviors as well as the institutional and social systems and structures in which individuals operate.

A system can be transformed over time through a series of incremental changes, so transformation may also come about as the result of a shock or strong pressure on the system. The transformation process can be accelerated by understanding what might be “transformative” and by seeking to promote interventions that have a good chance of bringing about fundamental change.

**Actively seeking transformative change through focused partnerships**

It is necessary to consider on the one hand the balance between drivers and enablers (catalysts of change) and existing strengths in the science and innovation system, and on the other hand drivers of vulnerabilities and constraints that act as impediments to change that have been acknowledged on the continent.

Significant or transformative change may come if the combined effect of the positive influences is more powerful and effective than the vulnerabilities and constraints in the system. If change is to happen, these two types of forces on and within the system should not be in equilibrium. Just a few strategic interventions over time may overcome the constraining forces, which is why it is important to try to recognize which evidence-based interventions might be transformative for the whole system.

An understanding of what could shift the balance in critical parts of the science, technology, and innovation system will help determine the strategies needed to bring about the desired transformative change. The challenge is to identify these factors and interventions that are likely to be most pivotal for this purpose and that might be poised to result in tipping points leading to transformation. The interventions have to be combined and sequenced well for best effect and to prevent disequilibrium. If the process is not properly managed and based on sound evidence and rigorous scientific methods, the whole system might become ineffective or even disintegrate.

There is also a need for “best fit” solutions, i.e. solutions tailor-made for a specific set of circumstances and able to evolve as the context evolves. Thus, the actual design, implementation, monitoring, and evaluation have to be managed by leaders at all levels of the system. These leaders would truly
understand the context within which the changes are to take place and committed to working towards success over time in partnership with one another.

In the context of science and innovation described above, one specific “best-fit” type intervention that can be used as a leverage point for change is focused partnerships. A number of trends in partnership mechanisms are beginning to emerge and take root, including (per illustration) the increase in South-South collaboration for example between emerging economies such as the BRICS countries and more broadly on the African continent. These types of mechanisms also create more opportunities for collaboration between funders themselves.

In particular, three trends in partnership patterns are of interest: (i) the growth in proportion of funds competitively allocated to block grants, (ii) greater research collaboration, and (iii) internationalization. All three trends highlight the increasing importance of international scientific and research collaboration as an imperative (rather than an alternative to) achieving national science, technology, and innovation policy goals. Furthermore, along with the shift towards increased collaboration, a change in the nature of collaboration is also noted. Although partnerships have typically been between researchers, national science academies, and other science and technology institutions, collaborations are starting to emerge between development partners, foundations, and private businesses.

Partnerships in science, technology, and innovation can be used for several purposes (including internationalization, capacity building, career advancement, or career renewal), but need not be limited to only one purpose. Potential partnership opportunities could bolster a wide range of areas, including strategic investment in centers of excellence (e.g. academies), projects, thematic programs, grants, stipends, vouchers, R&D tax credits, and loans. Large funding programs should seek to achieve, inter alia, the promotion of these aspects.

Collaboration between partners though meta-instruments can be used to coordinate research investments transnationally and typically includes a portfolio of research funding instruments. Developing countries, particularly those on the African continent, should consider these meta-instruments as a trend in national research funding to promote collaboration globally and link into global networks. Not only will this provide a networking opportunity, but will allow for increased capacities within the African funding agency and promote increased access to leverage knowledge resources (e.g. through shared databases). In addition to inter-funder collaboration, science academies have an important role to play in the promotion of research excellence and capacity development.

The emergence of the Future Earth\(^1\) initiative is a clear example of how international research groups are recognizing this need to harness their energies and function more synergistically. This global platform brings together the efforts of existing global environmental change programs [Diversitas (merging into Future Earth), IGBP, IHDP, WCRP and ESSP], to help develop a stronger and broader community. The Future Earth initiative illustrates the emergence of multi-level collaboration models which promote interdisciplinarity in science, multiple funders in alliance and the involvement of broad stakeholders (including policy-makers, funders, academics, business and industry, and other sectors of civil society) to co-design and co-produce research agendas and knowledge in order to ensure increased capacity

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\(^{1}\) Future Earth will be a global platform to deliver solution-orientated research for sustainability, linking environmental change and development challenges to satisfy human needs for food, water, energy, health.
development. The Belmont Forum\(^2\) stands out as another clear example of an alliance/collaborative approach to funding that seeks to pool resources available to funders for increased impact. The platform strengthens engagement between the research funding agencies and the academic research community allowing for improved co-design, co-alignment, and co-funding of major research programs.

**Toward leveraging impact through meta-collaborations**

In line with international trends and to achieve Africa’s development imperatives collaboration between science granting councils, science academies, and the donor community stands to play a potentially catalytic role in enabling transformative change in the science and innovation systems on the continent.

The current initiative between the African Science Academy Development Initiative (ASADI) (a project of the US National Academies), the Carnegie Corporation of New York (CCNY) and the NRF (a leading science granting council on the continent) represents an important step in the establishment of collaboration between academies, councils and donors on the continent. In particular, CCNY has demonstrated its commitment to this much needed revitalization of higher education on the continent, and in particular postgraduate education through their Excellence in Postgraduate Research, Training and Retention Program\(^3\). Further signaling their commitment – amongst other activities – Carnegie has recently hosted an Africa-wide workshop (in partnership with the NRF in South Africa) to examine the state of PhD production on the continent to identify what needs to be done to overcome the current challenges.

The objectives of the partners forum include:

- To provide networking opportunities for all partners – development banks, foundations, research councils, academies, and civil society – who have an interest in investing in capacity development initiatives on the continent;
- To begin debate and deliberations to explore new and innovative ways to support science, technology, and innovation in Africa;
- To determine what actions can collaboratively be taken in the short-term to strategically support upcoming initiatives [such as the African Science, Technology, and Innovation Forum in October 2014 (Rabat, Morocco) and the African Summit on Higher Education to be held in March 2015 (Dakar, Senegal)];
- To determine what actions can collaboratively be taken in the longer terms to support the African science, technology, and innovation landscape.

In order to achieve the above objectives, this pioneering side-event to the US-Africa Summit will stimulate debate on diverse perspectives and opinions from all contexts in order to stimulate creative thought towards a strategic approach going forward.

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\(^2\) The Belmont Forum is a group of high-level representatives from agencies and organizations that have, as a major portion of their responsibilities, funding global environmental change research.

\(^3\) The program aims to strengthen Masters and PhD programs in key universities, fostering disciplinary networks and fellowships for academics across sub-Saharan Africa and advancing academic leadership and policies.