

The Partnership for Skills in Applied Sciences, Engineering and Technology (PASET)



Creating a Critical Mass of Highly Skilled Science and Technology Professionals in Africa

OCTOBER, 2016

THE CHALLENGE

Today, Africa is on the cusp of a structural economic transformation. With its large pool of human and natural resources, it has been one of the fastest growing regions of the world despite the recent global economic slowdown. At this important juncture, it needs a critical mass of home-grown expertise to find its own blueprint for scientific and technological advancement in sectors such as agriculture, energy, manufacturing, technology and health. This expertise is also needed to build resilient economies and societies that can tackle new risks such as climate change and global pandemics. For African countries, there is no better time than now to accelerate a socio-economic transformation by developing skilled professionals in applied sciences, engineering and technology (ASET) fields – from technician to postgraduate levels – and provide meaningful opportunities for its millions of youth.

Such transformations have occurred in recent years for China, India, Korea and several Latin American countries through huge investments in science and technology capacity. Their experience underscores the importance of quality education at all levels, as well as the need for a healthy balance between scientific disciplines and the social sciences/humanities. However, current technical-vocational education in Africa fails to provide employment-ready workers for its emerging sectors, and its tertiary enrollments are still heavily skewed toward the humanities and social sciences – with less than 25 percent of students opting into science, technology, engineering and mathematics disciplines. According to the 2015 UNESCO Science Report, Sub-Saharan Africa (SSA) has less than 92 scientific researchers per million inhabitants, compared to an average of 1083 for the world.

PASET AS AN AFRICA-LED SOLUTION

The Partnership for skills in Applied Sciences, Engineering and Technology (PASET) was launched in 2013 by African governments with facilitation by the World Bank, to address systemic gaps in skills and knowledge in priority ASET fields, and to build the capacity of African education and training institutions to train high quality technicians, engineers and scientists to meet the demands of the economy. Since then, over 20 African countries, as well as representatives of Brazil, China, India and Korea have participated in PASET's consultations and regional forums, building the momentum for its partnerships.

There are already many regional and national initiatives to build Africa's scientific and technological capacity, supported by international donors and countries in Asia and Latin America. However, an operational platform like PASET was needed to effectively and urgently harness



HOW IS PASET DIFFERENT?

These distinct features set PASET apart from other development initiatives.

- **Combining African Ownership and Leadership with Global Knowledge:** The governments championing PASET have taken the lead in its governing bodies and in co-hosting its regional forums. They are also seeding PASET's Regional Scholarship and Innovation Fund for PhDs in ASET fields. A Consultative Advisory Group of eminent African scientists and academics provides technical advice, while the World Bank plays a facilitation and convening role, also providing technical assistance.
- **Focus on Priority Sectors:** PASET is clearly focused on the skills needs of about 10 sectors essential to Africa's structural transformation, including agriculture, mining, manufacturing, electrical power, infrastructure and construction, ICT, health and financial services, among others.
- **Continuum of Skills:** In contrast to other initiatives that focus on different education levels, PASET seeks to build a continuum of scientific and technical skills in its target sectors, from Technical and Vocational Education and Training (TVET) at upper secondary level to post-graduate level research.
- **Combining Regional and Country-Level Initiatives:** PASET's strong regional approach facilitates technical assistance, knowledge exchange and mobilization of resources at regional as well as country levels.
- **Public and Private Sector Engagement:** PASET engages with both public and private sectors, closely relying on the private sector for knowledge sharing, technical advice and resource mobilization.
- **Engagement with New Partner Countries:** While Asian and Latin American countries are already engaged in Africa through private investments and assistance for TVET and science and technology, their own experiences also contain invaluable lessons. PASET aims to harmonize these efforts at country and regional levels to expand knowledge-sharing as well as raise the level and impact of their assistance in a focused manner.

and harmonize these efforts to address specific priority sector needs. PASET was needed to also leverage the knowledge and experiences of Asian, Latin American and other countries investing heavily in Africa, and raise the level of their assistance.

PASET is rooted in the idea that African governments as well as private sector must take the lead in building its ASET skills, leveraging both regional and country-level initiatives as well as international resources and best practices. PASET's goals are consistent with the goal of creating quality basic education systems for Africa, which continues to be a priority for meeting its fundamental socio-economic targets. Its efforts to produce a higher number of quality graduates in ASET fields can influence the entire education pipeline by ensuring well-qualified teachers at all educational levels, including TVET institutions.

PASET'S 10-YEAR GOALS

At the PASET Regional Forum in Dakar, Senegal in June 2014, its stakeholders unanimously adopted a Call to Action that outlines these medium-term goals:

- Support training of at least 10,000 new PhD holders in ASET fields in Sub-Saharan Africa (SSA).
- Establish an SSA- wide regional post-graduate scholarship program in ASET programs.
- Double the number of students in ASET programs in at least 10 countries in SSA.
- Support high quality ASET programs and centers of postgraduate studies and applied research in ASET disciplines in at least five additional universities in SSA.
- Develop at least five regional TVET centers of excellence to train faculty of TVET institutions, enable resource sharing, quality assurance, and specialized training in emerging areas.
- Develop a regional quality assurance mechanism for ASET programs, benchmarked to comparable systems globally.
- Establish high quality data systems and benchmarking of ASET programs and institutions in at least 10 countries in SSA.

WHO BENEFITS FROM PASET?

- **Sub-Saharan African governments.** SSA governments, particularly their ministries of higher education or science and technology, are the prime movers of the initiative and will benefit from collaborating at a regional level. They will also acquire valuable information and technical assistance to inform their policies and develop costed, results-oriented plans (CAAP) to help align their programs, monitor results, and leverage more funding.
- **The Private Sector in SSA** will gain a stream of homegrown, highly skilled graduates (from the TVET level to researchers) for employment and internships.
- **ASET-focused Universities** will be able to (i) Improve the quality of their faculty, academic programs and research; (ii) Build stronger international ties with “sandwich” universities outside Africa who will serve as hosts to RSIF scholars; and (iii) Better assess their performance by participating in programs like the Regional Benchmarking Initiative.
- **TVET institutions** will improve their academic programs and their faculties’ professional and pedagogical skills. They will also benefit from the proposed TVET Centers of Excellence, which will provide faculty training, quality assurance and curriculum development.
- **SSA university faculty and students** interested in PhDs in ASET fields will be able to apply for funding through the RSIF, which will support their PhD training and research and subsequently, new enterprise development.
- **New Partner countries:** PASET’s platform can help Africa’s partner countries, especially countries such as Korea, China, Brazil and India, meet their bilateral development and investment agendas for Africa. PASET will also convene them to share knowledge, build capacity and explore synergies between their needs and the priorities of SSA countries.
- **Development partners:** Many development partners are already engaged in bilateral initiatives to support TVET or science and technology. With its African leadership, PASET provides an opportunity to scale these up and have a broader, regional impact.

CURRENT INITIATIVES

Each of PASET’s initiatives addresses a specific aspect of the ASET skills shortage in Africa. **Initiatives planned for the first phase include:**

- **Regional Scholarship and Innovation Fund (RSIF):** RSIF is PASET’s flagship initiative and will provide PhD training to create a highly skilled ASET workforce in both academia and industry, as well as build capacity of selected universities to deliver high quality PhD programs in selected thematic areas in partnership with high-ranking global universities. The Fund was seeded by Ethiopia, Rwanda, and Senegal with more governments expected to join. It is being implemented by the Association of African Universities in three windows: PhD training, Research, and Innovation. It recently launched a call to select its participating SSA universities on the basis of the quality of their PhD programs in targeted thematic areas and other criteria. Subsequently, it will facilitate scholarship recipients to undertake applied research to support priority development sectors, and in innovating for businesses or establishing new enterprises.
- **Regional Benchmarking Initiative for Universities:** Now operational, this initiative aims to improve the quality and relevance of higher education by equipping ASET focused institutions to identify their strengths and weaknesses, and assess and monitor their progress relative to similar national, regional and global institutions. Experts from Shanghai Jiao Tong University serves as a key partner providing technical assistance to the initiative, which has been joined by 48 universities.
- **Forums, learning events, workshops, exchange visits:** These events will make a strong case to governments, the private sector and institutions on the importance of capacity building in ASET fields. They will also promote knowledge-sharing between SSA countries as well as with development partner countries. Exchange visits have been organized with Korea to facilitate collaboration.
- **Country ASET Action Plans (CAAP)** are country-level plans that detail strategies for developing ASET skills from upper secondary/TVET levels through higher education. They will help countries mobilize funding from the government, multi-lateral agencies, new partners and the private sector, among other sources.

Second Phase Initiatives:

- **Regional TVET Centers for Excellence** will be focused on technical and vocational education and training. They will be modeled on the World Bank financed Africa Centers of Excellence (ACE) project for higher education.
- **Data Initiative** will build capacity for regular data collection and analysis needed to inform policy decisions and public dialogue in Africa.
- **Regional quality assurance framework for post-graduates** will ensure a commitment to quality and excellence in post-graduate programs.

HOW TO PARTNER WITH PASET

Here are a few ways by which SSA governments, the private sector, new partner countries, and development partners can support PASET’s activities.

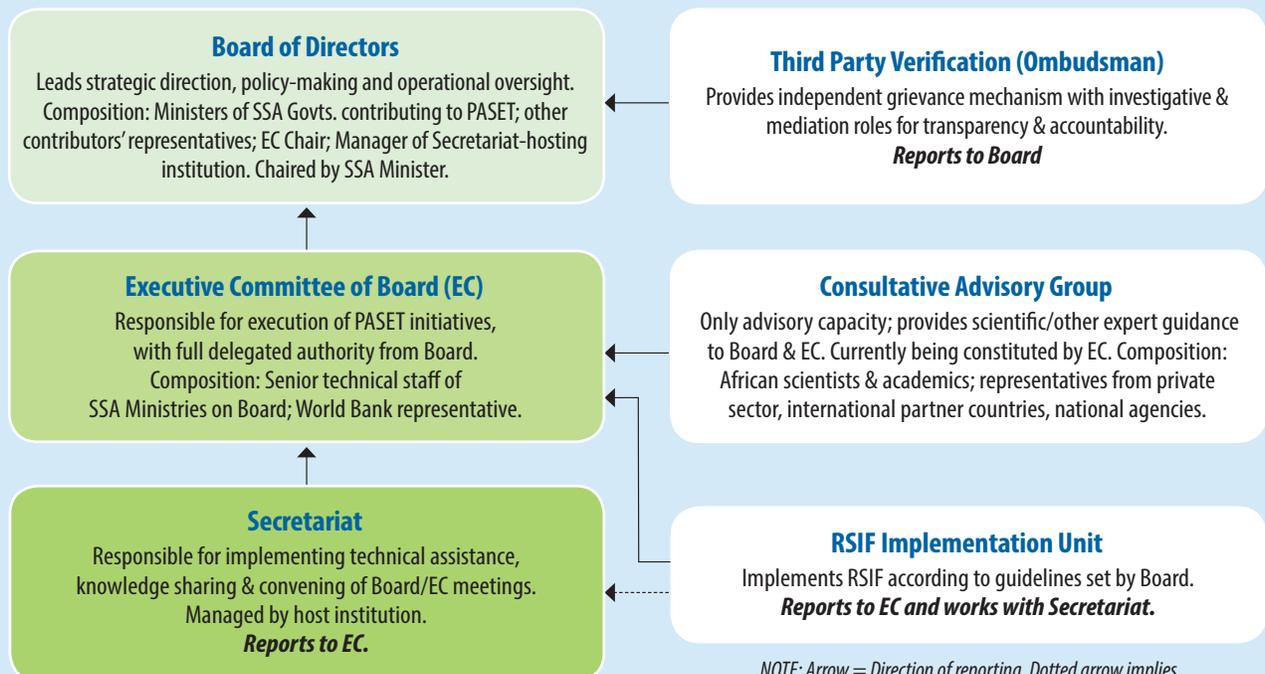
Sponsorship/Funding for one or more of PASET’s Regional Initiatives:

- Contributions are encouraged for all three windows of the Regional Scholarship and Innovation Fund (RSIF): (i) PhD training (ii) Research Grants and (iii) Innovation Grants.
- Technical assistance/funding of the Regional TVET Centers for Excellence
- Building capacity in Africa for the Regional Benchmarking Initiative for Universities
- Participation in advisory committees and technical committees

Supporting Country Level Initiatives:

- Technical assistance for developing the Country ASET Action Plans
- Provide internships and work experience for students graduating from ASET institutions
- Engaging in resource mobilization at the country level

PASET GOVERNANCE



For more information, contact us at pasetafrica@worldbank.org