African Development Bank Group

STRATEGY FOR HIGHER EDUCATION, SCIENCE AND TECHNOLOGY

Operations Policies and Compliance Department (ORPC)
Human Development Department (OSHD)

Revised February 2008

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

AAU	Association of African Universities
ACBF	African Capacity Building Foundation
ACU	Association of Commonwealth Universities
ADB	African Development Bank
ADEA	Association for the Development Education in Africa
ADF	African Development Fund
AFD	Agence Française de Développement
AU	African Union
AVU	African Virtual University
CEMAC	Central African Economic and Monetary Community
CFA franc	Communauté Financière Africaine (*Franc – currency used in the African Financial Community*)
CIDA	Canadian International Development Agency
COE	Centre of Excellence
CSP	Country Strategy Paper
DFID	Department for International Development (UK)
DGIS	Directorate-General for International Cooperation (Netherlands)
ECA	Economic Commission for Africa
ECCAS	Economic Community of Central African States
ECON	Chief Economist Office
ESPP	Education Sector Policy Paper
HEST	Higher Education, Science and Technology
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IDRC	International Development Research Centre (Canada)
ICT	Information and Communication Technologies
ISET	Institut Supérieur de l'Enseignement Technique
JAS	Joint Assistance Strategy
KIST	Kigali Institute of Science and Technology
MIC	Middle Income Countries
NEPAD	New Partnership for Africa's Development
NSF	National Science Foundation
OECD	Organization for Economic Co-operation and Development
OECD	Organization for Economic Co-operation and Development
OINF	Infrastructure Department
ONRI	NEPAD and Regional Integration Department
OSAN	Agriculture Department
OPEV	Evaluation Department
OPSM	Private Sector Department
OSHD	Human Development Department
OSGE	Governance, Economic and Financial Reforms Department
PHEA	Public Health Executive Agency
PPP	Public Private Partnership
R&D	Research and Development
REC	Regional Economic Community
RMCs	Regional Member Countries
S&T	Science and Technology
STI	Science, Technology and Innovation
SWAp	Sector-Wide Approach
UEMOA/ WAEMU	West African Economic and Monetary Union
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization

EXECUTIVE SUMMARY

In the 21st century, scientific and technological achievements have become commonplace. Science and Technology allow an abundant supply of food and safe drinking water. People can travel the globe with relative ease, and bring goods and services wherever they are needed. Growing computer and communication technologies are opening up vast stores of knowledge, supporting not only economic growth and development, but also strengthening effective democracy and governance. Most of these scientific and technological breakthroughs have taken place in tertiary education institutions in more developed countries. Contribution of the private sector is important, but cases in East Asia confirm that private sector usually invests in a given country when there is a core skills base to warrant return of the investments. The role of government in providing the critical mass of Science Technology & Innovation (STI) skills to attract local and foreign investors is essential.

As remarkable as these achievements are for other regions of the world, many more challenges and opportunities remain to be realized in Africa. Indeed, although vital for development, Africa's STI education and training infrastructure, particularly in fields such as agriculture and engineering, has been over the years under-valued and under-resourced. The neglect of its higher education and technical training institutions over the last four decades has negatively impacted on the capacity of the continent to supply the needed skills base, especially in science and technology. Under pressure of increasing demand and in some cases conflicts, the institutions of higher learning and training have deteriorated. In the meantime, Africa continues to import expensive technical assistance, which is a short term remedy but does not enable the countries to build their STI capacities and skills base.

Reforming and transforming higher education systems in Africa to energize and unlock the minds for brighter economic prospects is one of the main objectives of this higher education, science and technology strategy. Science and technology are vitally important for increasing Africa's competitiveness. The proposed strategy aims at refining and providing greater focus in the implementation of the Bank Education Sector Policy. It will contribute to accelerating economic growth through the provision of the needed expertise in science and technology, including intermediate and higher level vocational and technical skills. The Bank considers technical and vocational training as an important factor in skills development and in fostering science, technology and innovation, in particular in the application, adaptation and use of technologies.

The strategy will assist Regional Member Countries (RMCs) in (i) strengthening national and regional centres of excellence in the following selected priority areas: agriculture and livestock, health sciences and health delivery support services, engineering, business enterprise, training of teachers and educational managers; energy (ii) building and/or rehabilitating the existing science and technology infrastructure, including tertiary education institutions; and (iii) linking higher education, science and technology (HEST) to the productive sector. The focus of Bank support will be on existing institutions and the scope and mix of interventions will be determined through preliminary assessments.

Relevant quality secondary education, in particular, will always be a vital building block for higher education. Therefore, the Bank will continue to collaborate with other development partners, who are essentially involved in supporting the lower education sub-sectors, with a view to especially enhancing the teaching of maths, science and technical subjects at the secondary level.

The strategy recognizes that the Bank cannot be active in every country, but must aim to do so mainly with regional-focus centres of excellence. In line with the guiding principles of

selectivity, case by case approach, regional integration, and partnership, the strategy will also assist in retaining scientists and attracting African talent from abroad, while promoting cross-border migration in Africa and exchange of expertise. By doing so, the Bank is filling a gap and adding value at this juncture of the economic transformation of most RMCs.

The strategy also recognizes the critical importance of mathematics and science teaching at other levels of the education system, in particular, at primary and secondary levels. It will assist countries in reforming their education systems with a view to promoting more mathematics, science and technology learning in schools. Technical and vocational training being an important driver in skills development and particularly in the application, adaptation and use of technologies, the Bank will undertake studies, including Economic and Sector Work, to deepen its knowledge on the linkages between employment, youth and skills development. Accordingly, the Bank will undertake STI skills profile to guide its interventions in HEST.

There is also the need to take an expanded view of skills development as being on a continuum that involves technical, vocational, entrepreneurial, scientific and technological aspects. This means that curriculum and programme development must be informed by a selection of content and design considerations that cover low-level, intermediate-level and high-level skills. Accordingly, depending on the level and diversification of the respective RMC education and training systems, the HEST would allow for support to technical secondary schools, mid-level technical vocational institutions, polytechnics as well as university-level institutions.

An important new feature in the design of this HEST strategy is the development of an implementation action plan, which sets indicators and deliverables for the proposed actions. Given that this is the first attempt by the Bank in setting an orientation in HEST, the strategy will contribute to the gathering of baseline data and the design of indicators for monitoring the Bank's intervention in the sub-sector.

These indicators will be used to monitor the Bank assistance to the sector and to provide continuous feedback to the Bank and the countries. Accordingly, 2 years into the implementation of the strategy an internal evaluation will be carried out to assess the nature and effective demand from RMCs, as well as its complementarities with other sectors of Bank intervention. The proposed strategy, which has benefited from inputs of stakeholders during a consultation workshop, reaches out to all tertiary education institutions –not only universities– and sets the stage for further exploration of the sector, deeper understanding of related challenges, and identification of opportunities for the continued Bank support. It sets a balance between the general approach where the activities will encompass education sub- sectors and other sectors (health, infrastructure, water, etc) in its reach, and a responsive, selective and graduated identification of interventions to support.

The proposed strategy aims at revitalizing and promoting relevant and responsive Higher Education institutions and systems in Africa that unlock the minds and latent potentials of Africans and all others interested and able to effectively assist in overcoming the multitude of challenges faced by the Continent and its people. It will therefore, address the critical issue of re-positioning some potential African Tertiary and Vocational Training Institutes as well as National and Regional centers of Excellence to join the ranks of the best of the world. The strategy is firmly based on the "Bank's Education Sector policy" and recognizes the critical complementarity and value-added of Higher Education to the Development process through the promotion of Science and Technology, research, innovation, vocational training and skills development.

STRATEGY FOR HIGHER EDUCATION, SCIENCE AND TECHNOLOGY

1. Context and Background

1.1 African higher education is mainly university-based and state supported. It is responsible for the supply of high calibre human capital. During the 1950s and 1960s, African higher education institutions built a solid reputation as Centres of Excellence comparable to the best around the world. The University of Makerere, Fourah Bay College, the University of Ibadan and the Université de Dakar are few of the institutions where teaching and research were at a standard of international repute. Admission requirements and procedures were rigorous and their graduates were recruited into top positions in government and industry in the continent and abroad. High standards were reflected not only in the quality of academic life, but also with regard to the level of remuneration of faculty and staff, the quality of facilities afforded both students and faculty and the prestige they enjoyed in their various countries. Higher education received adequate resources to deliver quality education and to maintain high academic standards. However, with the economic crisis of the 1980s and the implementation of structural adjustment policies which gave priority to basic education, resources to higher education dwindled, resulting in a deterioration of the quality of educational services. Similarly, the withdrawal of donors from higher education led to a further deterioration of the quality of outputs. In 2006, only 35 Research and Development (R&D) centres were in existence for the 53 African countries, compared to 861 centres in North America, 655 in Asia and 1576 in Europe.

1.2 Lately, there has been increasing recognition that higher education has the potential to enhance economic development through technological catch-up. In the knowledge economy, higher education can help economies gain ground on more technologically advanced societies. However, the adoption of new technologies demands skilled labour to unlock the potential to increase productivity and economic growth. The expansion and strengthening of higher education in Africa is expected to promote faster technological catch-up and improve the abilities of the regional member countries (RMCs) to maximize their economic output. In particular, the transformative capacity of higher education in agriculture (through modernization of the production chain) is testimony to that effect. Furthermore, the strengthening of higher education will impact positively on basic education through the production of better trained teachers, especially for science, math and technical subjects.

1.3 African higher education is now at a crossroads. At national levels, the democratization and liberalization processes have put higher education institutions in a more vibrant and more transparent environment. At the global level, the impact of the unfolding knowledge society is reshaping higher education. The institutions will remain competitive only to the extent that they embrace the knowledge economy and networks, and to turn out an increasingly diversified range of skills in response to development needs.. The key challenge for the higher education systems resides in training Africans for the emerging new economy and in maintaining access and quality of outputs.

1.4 In the area of science and technology, disparities between Africa and developed countries in capacity are acute, and differences in economic growth due to the distribution, use, adoption, adaptation and generation of knowledge are widening. Africa is lagging behind as a complex set of institutions, agents, policies, linkages and networks are required to harness the benefits of science and technology (S&T) for development. In addition, the gender gap in higher education has remained stagnant, particularly in science related disciplines, where female enrollment rates stand at 39.9 percent. The role of governments in enabling science and technology-led growth has gone beyond that of facilitator of technology development. Governments are increasingly taking cognizance of the fact that the actors are more diverse and with a growing incidence of university-industry collaboration and public-private partnerships.

1.5 However, across the African continent, several barriers —capacity, policy, and market-related– have constrained the potential of important S&T-related ideas, products, and processes from equally contributing to the development of the countries. Nowhere in the world are these barriers to the access, adaptation, adoption, and generation of knowledge for development more glaring than on the continent. Differing modalities, conflicting policies, and divergent priorities within the domain of support to S&T reveal a lack of coherence and complementarity between government policies and donor priorities, and within the S&T strategies of many of the bilateral and multilateral agencies. In addition, higher education systems in most countries on one hand and S&T on the other operate in parallel, without much

connection to each other and with little linkages with the productive sector. The training and research activities of higher education institutions in Africa need to be better oriented towards the development of the skills, experience and entrepreneurial ability to innovate, fuel and maintain prosperity, growth and sustainability. Unfortunately, African countries have the lowest ratio of scientists and engineers in R&D. On average, countries in Africa have 35 scientists and engineers per million inhabitants compared to 168 for Brazil, 2457 for Europe and 4103 for the United States.

1.6 African leaders are cognizant of the above barriers, and more importantly of the capacity of S&T to boost and drive growth, create opportunities for sustainable development and reduce poverty. During the 2007 African Union Summit, Heads of State and Governments put S&T development at the center of their deliberations with firm commitments to build constituencies and champions for science, technology and innovation in their respective countries. African Member States also committed to promote research and development and design innovation strategies for wealth creation and economic development by allocating at least 1% of GDP by 2010 as agreed by the Khartoum Decision. Finally, the Heads of State called for further studies on the creation of a fund to support S&T development in Africa. The Bank, the United Nations Economic Commission for Africa (ECA), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the AU Commission have been requested to collaborate in this regard.

1.7 The proposed HEST strategy builds on the Bank Education Sector Policy and aims at developing a framework for the scaling up of the Bank's involvement in the tertiary education sub-sector and on the international commitment to support the revitalization of higher education in Africa. It is designed not only to strengthen higher education and science and technology but more importantly to create and nurture the intersection between the two for relevant science and technology skills development. The strategy will contribute to building the capacities of RMCs to develop expertise and skills in strategic areas such as energy, infrastructure, water, agriculture and livestock, ICT, teacher training, the financial industry and health.

1.8 Whilst the strategy will have the foregoing as its initial priority focus, it will be adjusted where needed in the light of implementation lessons and in response to evolving country needs. Although most higher education training is provided in universities, this strategy reaches out to other institutions of tertiary education, with the aim of creating poles of excellence and building networks of complementary centres of excellence. The HEST strategy is developed in a favorable development context. At the international level, there is a renewed commitment of partners for Africa and education in particular. At the continental level, the prospects for economic growth have never been better at an average of 5.7% per year for the past 3 years and the commitment for regional cooperation has never been stronger. As peace returns and conflicts are being resolved, giving way to productive engagement in place of internecine conflicts, the strategy will contribute to reducing the brain drain by increasing the mobility of experts within the continent and strengthening the networks of scientists.

1.9 From its inception, the drafting of this strategy has benefited from inputs of various stakeholders, internally and externally. Within the Bank, the process has been collaborative. ORPC and OSHD have jointly led the process of the concept design and drafting of the strategy. Inputs have also been received from departments and units within the Bank at the internal and interdepartmental review stages. Senior Management of the Bank, through the Operations Committee has also reviewed and cleared the strategy document. Externally, the process has been very participatory. Positive inputs have been received from partners (World Bank, UNESCO, CIDA-Canada, UNIDO, UNCTAD, NEPAD, Association of African Universities, etc.), culminating in the Stakeholders Consultation Workshop held in Accra, Ghana in April 2007.

2. Bank and Other Donors' Involvement in Higher Education, Science and Technology

Bank Involvement in HEST

2.1 Between 1975 when social sector financing at the Bank commenced and 1985, the Bank did not have an articulated policy for the education sector. In January1986, the Bank adopted its first education policy to respond to the concerns of: (a) access and equity in education; (b) quality and internal efficiency of education; relevance, utility, and external efficiency of education; management, organization and planning of education; and (c) education cost and

financing of education.

2.2 A revised Bank Education Sector Policy paper was approved by the Board in 1999. The policy is broad in scope and relevant to the current strategy for Higher Education, Science and Technology (HEST). It outlines the challenges and opportunities for African education, and defines five strategic actions for achieving these policy guidelines. They consist of improving: (a) access to educational opportunity with an emphasis on policies supporting Universal Primary Education in RMCs by the year 2015; (b) social and gender equity in education; (c) quality of instruction and output by strengthening physical and human resources at all levels of the education system, stressing qualitative investments which had been neglected in past interventions; (d) management and planning capacities, including Ministry of Education data gathering/analysis/storage, decentralization, and professional education networks; and (e) educational financing mechanisms.

2.3 The table below outlines the pillars of the HEST strategy as compared to the orientation of the 1999 Education Sector Policy. It shows that the proposed HEST strategy complements the existing policy and clarifies the Bank's approach in the sub sector. It sets science, technology and innovation, through the support to higher education, at the core of the Bank interventions. It is the assertion of the need for African countries to invest in the promotion of growth by building the needed human capacity to stimulate creativity. It puts science and technology at the center of the development agenda to overcome poverty.

2.4 The table confirms that far from being a complete shift, the HEST Strategy is in line with the Education Sector Policy. It refines the priorities and provides greater focus in the strategic implementation, thus allowing the Bank to gradually move towards skills building for competitive African economies. Indeed, the HEST Strategy places the Bank in a strategic position to contribute to (i) the process of adoption and adaptation of science and technology as enablers of growth in Africa, and (ii) building the critical mass of skills for increased competitiveness in the globalized economy.

Focus of Bank Education Sector Policy & HEST Strategy

	Education Sector Policy	Higher Education, Science and Technology Strategy
Objective	To primarily improve access to quality basic education, whilst recognising the need to ensure balanced development of education systems (through giving appropriate attention to secondary, technical vocational training and tertiary education).	To assist RMCs in developing the necessary science and technology-oriented skills to increase economic competitiveness and sustain growth.
Guiding Principles	. Holistic and Integrated Approach . Ownership, responsibility and Control of RMCs . Participatory A p ry pproach . Regional Integration . Private Sector and Non-Profit Education Providers	. Improved design and delivery of science and technology-oriented programmes at secondary school . Regional Approach . Case by Case Approach . Focus and Selectivity . Functional relationship to other Bank sector operations . Partnerships with private sector and between countries . Harnessing the Diaspora in STI

Strategic Actions	. Improving Access to Educational Opportunity, including TVET . Improving Equity in Education . Improving Quality of Instruction and Output . Improving Management and Planning Capacities . Improving Educational Financing Mechanisms	. Support to National and Regional Centres of Excellence . Building Infrastructure and Upgrading equipment for HEST . Linking HEST and the Productive Sector . Targeted support to Universities, Polytechnics and specialized technical Training institutions

Other Donors Interventions in HEST

25 Over the past two decades, higher education, science and technology received limited attention from donor agencies, due partly to their focus on basic education. However, in the past few years, there is increasing recognition that in a knowledge economy, higher education and particularly science, technology and growth are engines of growth. This has led multilateral development finance institutions, bilateral agencies and foundations to revisit their positions vis-à-vis HEST.

2.6 Currently, the renewed interest has resulted in the inclusion of HEST & STI in the program of NEPAD and in the agenda of the AU Heads of State Summit held in January 2007. Key multilateral institutions supporting HEST include the World Bank, UNESCO, UNIDO, and UNCTAD. At the bilateral level, several agencies have articulated policies and programmes in support of HEST in Africa. These include the AFD, AUF, CIDA, DFID, IDRC, JICA, NSF, NUFFIC, SIDA and USAID. As well foundations such as Ford, Rockefeller and MacArthur, have joined forces to complement activities of universities and associations such as the AAU and the ACU in support of HEST in the continent.

Lessons Learned

2.7 A preliminary analysis of the past Bank's interventions in RMCs shows that support went mainly to Basic Education –i.e., primary education (26.6%) and secondary general education (20.3 percent)– followed by Technical and Vocational Training (35.3 percent), Higher Education (10.3), Literacy and Non-Formal Education 5.9 percent) and Skills Development (1.6 percent). It is worthy to note that the Bank operations' objectives have shifted over time from the provision of infrastructure to more qualitative and institutional support. Infrastructure represented 82.9 percent during 1975-1986 period, 78.4 percent for 1987-1999 and 55.1 per cent for 2000-2005.

2.8 Although the Bank has been primarily active in basic education, tertiary education has always been supported. Its current portfolio of projects includes the African Virtual University, the Kigali Institute of Science and Technology (KIST) in Rwanda and the Institut Supérieur d'Enseignement Technologique (ISET) in Mauritania. In addition, the Bank has undertaken an extensive study of higher education in the West Africa Economic and Monetary Union (WAEMU) zone, which resulted in an approved multinational project. This approach will be used in the design of a support to higher education in countries of the Central Africa Monetary Union (CEMAC) zone.

2.9 From the Bank's past and current portfolio, the following lessons can be drawn:

- The Bank investment in HEST has not been guided by a comprehensive vision nor informed by a full strategic approach to the sub-sector.
- In several cases, HEST activities have been incorporated as components of larger capacity development projects.
- Economic and sector analyses are needed if the Bank intends to significantly invest in HEST.
- The development of activities in HEST will require the building of an internal Bank capacity to generate knowledge on the sector.
- Opportunities should be utilized in country assistance strategies and in the design of other sector projects to identify and capitalize on the synergies with HEST for the purposes of addressing attendant skill development, research and innovation needs.
- The reinvigoration of HEST requires regional cooperation and the building of regional centres of excellence to support national institutions.
- Given the magnitude of the needed resources, support to HEST demands the

building of effective partnerships with other institutions, including UN, bilateral and multilateral agencies, foundations and the private sector.

- For TVET to be relevant and responsive, greater emphasis should be put on the development and use of technical and vocational qualification frameworks that are informed by labor market survey information. Furthermore, to ensure that both the needs of the formal and informal segments of the labor market are catered for, close public-private partnership must be obtained through the creation of broad-based national training authorities. Experience has also shown that Competence Based Education and Training (CBET) approaches lend themselves favorably to the development of short modularized courses that are cost-effective, time-efficient and more directly relevant to the acquisition of skills for employment, self-employment and entrepreneurship.

Other Policies relevant to HEST

2.10 On the policy side, the Bank has developed policies and strategies in support of its operations. In addition to its *Economic Cooperation and Regional Integration Policy*, which offers an appropriate framework for assistance to the revitalization of higher education at continental and regional levels, the *Guidelines on the Financing of Multinational Operations* and the *Private Sector Strategy* are policies relevant to the HEST sector. In addition, the *Proposal for Enhancing Bank Assistance to Fragile States* and the *Policy on Information and Communication Technologies* when approved by the Board will provide complementary frameworks for investing in the sector.

3. Framework and Issues to be addressed by the Strategy

3.1 As indicated earlier, science, technology and innovation are critical to economic growth. To be sustained, they have to be embedded within a broader, well functioning national innovation system involving the investment and actions of many public and private sector actors, ensuring R&D transfer into industry. Trade liberalization and the rapid fall in communication and transport costs mean that African countries have increasingly to compete with significantly lower labour costs and reasonably well-educated labour forces, particularly from Asia.

3.2 In this context, it is reassuring to note that most African countries already have in place the key institutional components needed to make the transition towards being a participant in the knowledge economy. In spite of the poor environment, higher education institutions in Africa are often the only places with the human resources, skills, logistics, organization and networks that drive quality training of human resources and the conduct of advanced research.

3.3 The Bank's objective in engaging in the revitalization of African higher education, research, science and technology is to promote economic growth and regional integration through the development of relevant and responsive higher education systems in Africa. In preparing this strategy, the Bank wishes to ensure that the sector plays a key role in economic growth and poverty reduction. In this regard, the Bank's strategy for the development of higher education, research, science, and technology in Africa will be based on following guiding principles.

Functional Relationship with other Bank operations

3.4. By its very nature, higher education, science and technology is very much at an interface with the world of work and praxis. Therefore, the activities of the Bank in quite a number of fields, including agriculture, livestock and rural development, engineering,

energy and infrastructure, water, finance services, business enterprise, health and education training, as well a research and knowledge building will be taken into consistent consideration. Consultations with the respective Bank operations departments and ECON will be crucial. In the interests of synergy and complementarity, the ways in which support to national and regional institutions of training and research will be determined will take into account the nature of existing or prospective Bank interventions in the areas listed above.

Regional Approach

3.5. The Bank recognizes the role of HEST in promoting regional integration and cooperation in Africa. Revitalizing higher education, science, technology and research in Africa is a means of increasing mobility of skilled labour and overcoming the problems of economic balkanization. Existing national and regional centres of excellence will be used to provide training and improve the conditions for conducting scientific and technological research. By supporting centres of excellence, the Bank aims to position African training institutions among the best in the world, and create an environment in which higher education institutions in Africa will figure among the top choices of students and families. Networks of higher education, science and technology institutions will be established and/or strengthened to enhance the collaboration with sister institutions, including those in other regions of the world.

Case by Case Approach

3.6. The Bank recognizes that its RMCs' needs in STI are diverse and at different stages of development. Some have well developed quality basic education systems with high rates of completion and fast developing tertiary education systems. Others are still essentially dealing with the education for all challenge and relatively at early and varying stages of tertiary education development. Therefore, the demands emanating from the countries for support in STI will vary accordingly and are expected to range from support for capacity building, reforms, policy advice to building STI infrastructure and establishing national and regional centres of excellence. As well, few countries are ready to engage with the private sector in building innovation systems and developing public-private partnerships in HEST. The Bank will, therefore, be responsive in its approach and will examine requests on a case by case basis.

Focus and Selectivity

3.7. Focus and selectivity will guide the interventions of the Bank in the areas of HEST. The demands of the sector are so huge that the Bank cannot deliver on all them, nor does it have the necessary resources (human and financial) to do so. Indeed, resources are scarce relative to the needs of the countries. The Bank will, therefore, only support activities in which its contributions add value. Significant efforts will be devoted to dialogue with the RMCs for focussing on science and technology areas. Within the wide field of support to higher education that may be needed in the RMCs, it is to be expected that the other development partners may have similar or varying fields of interest. The Bank for its part will focus on the few domains identified under the HEST which are consistent with other Bank overall strategic orientation and have a direct bearing on intermediate and high level vocational and technological skills needed by RMC economies.

Partnerships and collaboration with other institutions

3.8. Providing even the most basic requirements to enable the HEST sector play a role in African economic revival is a challenge that cannot be met by any single development partner or the countries alone. In this context, the private sector is a strategic partner in African higher education. It is already the fastest growing segment of post-primary education on the continent. In many countries, private higher education operates in collaboration with foreign universities, including church/religious led partners. In most cases, inadequacies in legal provisions, high demand and poor monitoring on the part of government has led to mushrooming of private higher education in an unregulated fashion. While promoting private sector investment in higher education, science and technology, the Bank will support the creation of regional regulatory bodies for quality assurance in higher education. It will also serve as a catalyst for bringing private sector financing for incubators and innovations that increase value in the production chain. In addition to the private sector, the Bank will continue to strengthen its partnerships with other development partners –in particular, the World Bank, UNESCO, AFD, DFID, the AU & NEPAD, UNECA, and ACBF.

4. Pillars and Special Initiatives of the Strategy

4.1 The Bank is conscious that building STI capacity in the RMCs requires (i) capacity development and infrastructure building, (ii) government commitment, (iii) private sector involvement –including industry–, and (iv) appropriate policies for reform. It would also imply the promotion of national innovation systems. The strategy will contribute to the strengthening of African institutions of higher education. In line with the guiding principles, this strategy will be very selective in its support to rebuilding Africa's skills base, especially scientific and technical. Three strategic pillars will define the focus of the Bank interventions: (i) Support to National and Regional Centres of Excellence; (ii) Support to Infrastructure for Higher Education, Science and Technology; and (iii) Linking Higher Education, Science and Technology and the Productive sector.

Strategic Pillar 1: Support to National and Regional Centres of Excellence

4.2 As indicated earlier, HEST infrastructure has been over the years under-funded and under-valued, resulting in the deterioration of existing infrastructure, including regional centres. However, while recognizing the need to build STI capacity, the Bank is cognisant of the fact that it cannot do so in every country. Regional focus-centres of excellence will therefore assist the Bank in developing economies of scale and synergies in the respective science fields.

4.3 Through this pillar, the Bank will explore the possibilities of upgrading existing national and regional centres/poles of excellence to provide quality tertiary level training with the view to improving the conditions for conducting scientific and technological innovations. The Bank will support the establishment of networks of higher education, science and technology institutions to enhance collaboration and create economies of scale. In line with its regional integration mandate, the Bank will promote the harmonization of training programs to support incorporation of national institutions in the network of centres of excellence. Support for linking tertiary education institutions in small states to regional institutions through distance and e-learning modalities will be explored. Specifically, the pillar will assist the Bank in:

- Assessing the existing centres of excellence, whether national or regional;
- Enhancing the quality of science and maths teaching in primary and secondary education, through the provision of qualified teachers;
- Rehabilitating and or building new regional infrastructure for STI, in particular (i) agriculture and livestock, (ii) engineering, infrastructure and water, (iii) health, including maintenance of health infrastructure, (iv) ICT, and (v) financial management services;
- Strategic tapping of expertise within the African Diaspora for STI activities in the centres of excellence; and
- Networking existing institutions of science and technology.

Strategic Pillar 2: Building Infrastructure for HEST

4.4. The Bank regional member countries need relevant minimum infrastructure to support science, technology and innovation. Although most RMCs possess the basic infrastructure needed for higher education, science and technology, investments will be necessary to upgrade the existing infrastructure or rehabilitate facilities, especially in countries emerging from conflict. The Bank will support the building, upgrading and rehabilitation of select higher education institutions, in particular inter-state research schools and centres. It will also provide resources for laboratories with a view to promoting math and science teaching for engineering, agriculture and health. In this regard, the Bank's support will assist in creating a critical mass of African scientists and technicians, as well as increase access to affordable state-of-the-art research facilities. Particular attention will be paid to fragile states, where the infrastructure has been destroyed by civil wars and conflicts. The Bank will endeavour to undertake the following:

- Enhancement of ICT infrastructure, including the provision of fiber optic, and establishment of training centres;
- Rehabilitation and or building of national infrastructure for technology development, especially in fragile states;
- Development of HEST teaching facilities and equipment; and
- Support to a limited sustainable technology development infrastructure (especially, science parks).

Strategic Pillar 3: Linking HEST and the Productive Sector

4.5. In this pillar, the Bank will work with other partners –in particular the private sector– to design and implement strategic interventions for sustaining economic and social growth in the RMCs. For example, linking higher education to the extractive industries is essential for the skills directly or indirectly linked to the needs of the industry. Similarly, tourism has become a major investment sector in Africa as it provides revenue to millions of people. However, many countries lack trained human resources to provide competitive services (including hotel services, road maintenance of infrastructure, construction, repairs, etc) compared with countries in other regions. Similar to the gender and governance areas, the Bank will produce national and regional science and technology skills profiles. Specifically, the Bank will work with other partner institutions and the private sector to:

- Undertake STI national and regional skills profiles;
- Support RMCs in developing national innovation action plans;
- Strengthen HEST-industry linkages, with an emphasis on the setting up of incubators;
- Promote and support measures for increasing the participation rate of women in science and technology-related training and research activities in all institutions benefiting from Bank support;
- Cultivate technology development through partnerships with the private sector; and
- Integrate indigenous knowledge into innovation systems.

4.6. Targeted reforms in STI will be those that strengthen management, governance and financing of higher education institutions at the national and regional levels, to ensure access, relevance, quality and equity, and contribute to strengthening intellectual freedom and building democratic societies. This will require the building and/or strengthening of sound management institutions, which will contribute to enhancing the relevance and effectiveness of higher education and to developing the skills needed by the private sector. The

reforms will also address the gender enrolment gap in tertiary education, especially in math and science in addition to other forms of participation in higher education, science and technology, such as memberships in faculty administrations, professional bodies among other diverse concerns. In addition, the Bank will support reforms designed to establish a regulatory environment conducive to wider private sector participation and investment in higher education.

4.7 To deliver on the above pillars, the Bank will tailor its support to the different needs of its RMCs. The market segmentation approach will allow the Bank to target countries with specific needs and avoid a "one size fits all" approach. For countries emerging from conflict, the Bank will rely on opportunities offered by its strategy for fragile states to support the rehabilitation of infrastructure and build capacity. For these countries, the Bank will also invest in setting up appropriate higher education, science and technology governance structures. The Bank will be proactive with its MIC countries, while tailoring its response to ADF countries, within the resources allocated for the countries and in line with the pillars of the CSPs.

5. Lending and Non-Lending Instruments & Institutional Arrangements

5.1 The creation of a separate division for higher education and vocational and technical training in the Bank's new Operations structure is a reflection of the value the institution places on higher education and training of skilled professionals in Africa in the 21th century. This division will be primarily responsible for the operationalization of this strategy.

5.2 Working with country and regional departments, the division will identify and select projects/programmes to be funded based on regional/country, public or private sector and sectoral niches as determined by the regional assistance strategy or the country's CSP or Joint Assistance Strategy (JAS). Inclusion of HEST in the PRSPs and CSPs is central to the selection of operations to be undertaken by the Bank in the countries and at the regional level.

Lending and Non-Lending Instruments

5.3 The Bank will not only rely on existing lending and non lending instruments, but will explore the options of private sector lending in support of HEST.

- ADF Loans & Grants – Through the ADF window, in line with priorities identified in the CSPs and based on the resource allocated to each ADF country, the Bank will provide loans and grants to strengthen higher education, science and technology in the ADF countries. The grant component will be used primarily to build capacity (including human capacity), especially when dealing with fragile states.
- MIC Grants – The MIC grants will be used to undertake the necessary studies, and develop the demand in the Bank's middle income countries. It will also be used to "soften" the terms of loans and make the Bank's proposals more attractive to countries that have access to other resources.
- ADB Loans – ADB countries constitute the clientele more "ready" for investment in higher education, science and technology. There is a strong demand for higher education, science, technology and innovation and the potential for the Bank to assist these countries is real. Establishment of techno-poles and techno-parks is likely to constitute the main focus of the demand from ADB countries. However, some of the ADB countries may not need Bank financial resources. Rather, they would be interested in the Bank's expertise and advisory role. The Bank will, therefore, explore possibility of co-partnering with the countries in providing relevant technical expertise and guidance on appropriate investments.
- Multinational Window – This proposed strategy will assist the Bank in delivering on its regional mandate. Higher education, science and technology is one of the tools available to the Bank for strengthening regional cooperation, mobility of skilled labour, regulation of learning institutions, harmonization of training, and collaboration in research an technological innovation, as well as construction

of infrastructures for regional institutions. The Bank's multinational window will be accessed for that purpose.

- Private Sector Loans – The investments made by countries in basic and secondary education have resulted in significantly increasing the demand for higher education. Private tertiary education institutions have mushroomed all over Africa, albeit deficiencies due to lack of regulation, proper accreditation and quality assurance. By teaming up with the private sector department, OSHD will be exploring sovereign guarantee to governments as well as non-sovereign guarantee loans to credible national or regional private entities engaged in HEST. The Bank will also play a catalytic role in bringing together governments, private sector, foundations and other key partners for PPPs in HEST. Similarly, potential private sector operators will be encouraged to invest in incubators and innovation centers.

Institutional Arrangements

5.4 The complexity of the issues requires strong collaboration, both inside and outside the Bank. In the Bank, the three divisions of the Human Development Department will need to work closely to deliver on the proposed pillars. It is expected that the division of basic education will undertake activities geared at promoting science teaching at primary and secondary education, while the health division will engage in strengthening health research and training institutes. In the collaborative process of developing CSPs and JAS with RMCs and development partners, appropriate information on HEST will be provided to the countries. Similarly, close collaboration with OSAN, OSGE, ECON, OINF, ONRI and OPSM will be needed to deliver this strategy. The main responsibility to identify, appraise and implement projects/programmes lies with OSHD.

5.5 As indicated earlier, investments in ESW will be essential in gathering baseline data, developing the necessary knowledge of the sector and building credibility vis-à-vis African ministries and other partners. This requires the building of the capacity of the division of OSHD.2 through the recruitment of additional staff, especially in the area of science and technology.

5.6 Outside the Bank, partnerships with ministries of higher education, science and technology, bilateral and multilateral institutions, foundations and the private sector will be central to delivering on this strategy. Taking into account the fact that the demand from RMCs far exceeds the Bank resources, every effort will be made to bring partners on board at appropriate stages in the design stages of interventions.

6. Resource Requirement

6.1 Resources required for the Bank interventions in HEST will be drawn from the countries allocations, in the case of ADF countries. With regard to ADB countries, the Bank will as much as possible use the MIC facility to prepare its interventions. There is, therefore, no additional resource requirement in terms of project/programme financing.

6.2 As the Bank progresses in its support to HEST, there will be a need for revisiting and adjusting the skills mix to bring on board experts in (i) technology and innovation, and (ii) and skills development. The projected demands from RMCs for support in HEST, including technical and vocational training will necessitate a complement of expertise to develop and implement the operations. As well, several ADB countries will need STI policy advice, which the Bank should be prepared to provide. The recruitment of 3 professional staff over the next 2 years will equip the Bank with the capacity to respond to the demand.

7. Monitoring and Evaluation

7.1 Given that this is the first systematic involvement of the Bank in higher education, science and technology, particular attention will be paid to monitoring and evaluating the implementation of the HEST strategy. The implementation action plan (see Annex 1) contains clearly defined steps for implementing these actions and output indicators. Putting partnership at the core of the implementation strategy, the action plan also identifies the potential partners,

including African countries and their RECs.

72 After two years of implementation, a joint review of the strategy will be undertaken by ORPC, OSHD and OPEV to assess how, within the Bank, the strategy is operationalized across organizational units. Similarly, a review will be conducted after five years to assess how RMCs are taking advantage of opportunities offered by the Bank's support to higher education, science and technology. These reviews will provide room for adjustments in the strategy and for ensuring that the necessary skills are being produced at different levels of the education system in Africa to sustain the competitiveness of the economies.

8. Conclusion

8.1 In order to support the resurgent growth in countries and enhance the linkages between higher education and society, populations and governments are requesting the re-examination of the developmental role of higher education as a whole. The proposed strategy is a response to such a call. The Bank is convinced that appropriate higher education, science and technology are important for economic growth and poverty reduction. Consequently, the Bank is poised to effectively support the RMCs to revitalize higher education, science and technology through in-depth reforms and investments aimed at making them more relevant and effective. The Bank is also aware of the potential that the proposed reforms have for intensifying economic cooperation and integration in Africa.

8.2 This document has identified old and new challenges that African higher education systems must face urgently in order to reap the benefits of globalization. Most of these challenges can be overcome with support and assistance from external development partners, but African countries must make a sustained effort in meeting them. The strategy has identified three pillars to which the Bank will direct its resources, with a view to enhancing the quality of higher education, research and innovation in Africa. To improve conditions of access to higher education, the Bank must commit to financing the construction and rehabilitation of education infrastructures, in particular the provision of well-equipped scientific laboratories in fragile states. Regional-focus centres of excellence offer unique opportunities for leveraging inter-country expertise. Linking higher education to the labour market and making the training more relevant to supporting economic growth will be achieved by bringing partners – including the private sector– together to explore the economic outlook of the countries. Finally, cognizant of the fact that reforms the quality of training is dependent on good governance in higher education institutions, needed institutional and policy reforms will be supported by the Bank, in partnership with other development agencies.

8.3 The strategy will help develop an operational network that will allow exchange of academic management information in Africa for a more integrated management of students' records, human, material and financial resources. Stronger collaborative relations will be developed between higher education and the labour market, including innovative resource mobilization methods for improvements of schools and financing centres of excellence. There will be greater incentives to promote research, science and technology in selected applicable research findings being made available to help improve productivity, particularly in rural and peri-urban areas.

8.4 For all the above added value, it is recommended that the Boards of Directors adopt the African Development Bank Group Strategy for Higher Education, Science and Technology.

Annex 1

Higher Education, Science and Technology, and Technical and Vocational Education and Training Action Plan Matrix

Pillar I: Support to National and Regional Centres of Excellence

Time –Frame	Key Actions to meet challenges in the pillar	Constituent Activities	Expected Outputs	Indicators	Potential Partners (Identified during field visits and other operations)
Short term	Action 1: Identify potential and existing Centers of Excellence (COE)	1. Define criteria and standards for COEs 2. Conduct surveys to assess institutions on basis of defined criteria and standards	· List of potential and existing COEs available	· Number of national COEs and Regional COEs meeting standards identified for strengthening	· AUF · UNESCO · AAU · RECs
Medium term	Action 1: Improve relevance and quality of training at COEs	1. Review and upgrading of curricula and pedagogy to be in line with required HEST content and best practice . Staff development through additional and supplemental training opportunities of a suitable duration	· Curricula reviews launched at all identified COEs • Long-term plans prepared Qualified staff available for COEs	· Existence of revised and validated curricula and pedagogical approaches endorsed by stakeholders · Number of qualified staff per academic discipline	· AUF · AAU · ADEA · UNESCO · CAMES · PHEA · NUFIC
	Action 2: Strengthen physical infrastructure of COEs	1. Assess infrastructure needs 2. Build modern ST infrastructures in agriculture and livestock, engineering, health services, ICT, and financial sector management 3. Provide state of art equipment	· COEs operational · Technical staff trained on operation of equipment; Maintenance plan prepared and in use	· Number of COEs established · Levels of enrolment and graduation of students (particularly female) at COE faculties · Degree appropriate use and maintenance of COEs, IT and specialised equipment	· IDRC · UNESCO · Rockefeller Foundation · AAU
Long Term	Action 1: Promote networking of COEs	1. Develop cooperation and exchange programmes of staff and students 2. Promote joint research activities within networks 3. Promote linkages of COEs with national and foreign institutions	· Regional networks of COEs operational · Networks of COEs with national and foreign institutions established	· Number of functional regional COE networks · Number of annual joint research and student exchange programmes with affiliated national and foreign institutions	· AUF · IDRC · UNESCO · AAU

Mise en forme : Puces et numéros

	Action 2: Establish Distance Education Systems in support of regionally-linked higher education provision in Small States	1. Needs assessment and feasibility studies in small states; 2. Design of distance education (DE) delivery modalities, adaptation of courses, fulfilment of accreditation requirements 3. Build infrastructure , acquire equipment, staff, orientation training of teaching staff	· Needs identified and validated · DE designed in accordance with needs · Infrastructure and equipment available · Staff trained	· Number of training institutions in small states running Distance Education programmes in collaboration with appropriate regional institutions · Enrolment rates in DE programmes	· AUF · CAMES · AAU · UNESCO · AVU

Pillar II: Infrastructure Development for Science and Technology

Time-Frame	Key Actions to meet challenges in the pillar	Constituent Activities	Expected Outputs	Indicators	Potential Partners (Identified during field visits and other operations)
Short-term	Action: Enhance information and communication technologies (ICT) availability and training capacity in ICT in HEST-TVET institutions	1. Conduct national ICT-in-education needs assessment of training institutions (universities, secondary schools, TVET Institutions, teacher training colleges, etc.) 2. Upgrade connectivity and availability of computers in HEST Institutions to enhance teaching, learning, and research 3. Produce study of the most critical infrastructure constraints(e.g., transport, telecom, electricity, etc.) constraining the potential of science and technology to contribute to the growth of RMCs	· ICT connectivity and hardware improvement projects initiated in several HEST institutions · Upgraded connectivity and computerization of libraries in higher education institutions (HEI) and effective access to on-line resources · National plans for Technology Development infrastructure (TDI) prepared in some RMCs	· % of facilities and departments at training institutions effectively inter-connected through a local area network · National Plans for TDI prepared and validated in at least 6 RMCs every year	· CISCO · HP · Microsoft · World Bank · KIST, Rwanda · India · RECs · UNESCO
Medium-term	Action: Enhance infrastructure for technology development	1. Build and/or rehabilitate HEST infrastructure, especially in fragile states 2. Launch series of "Infrastructure Planning for Technology Development" (IPTD) workshops at the national level to allow for priority setting, awareness raising, and partnership cultivation	· HEST Infrastructure built and/or rehabilitated · Projects to support Technology Development launched	· % of institutions built and/or rehabilitated · Degree of implementation of TDI National Plans	· World Bank · Bilateral donors

Long-term	Action 1: Develop and implement a long-term program to enhance HEST teaching & research facilities and equipment	1. Determine HEST Infrastructure development and rehabilitation needs according to a rolling programme of 6 RMCs per year; 2. Run joint partnerships with RMCs, development agencies and private sector interest groups for the implementation of a rolling programme of infrastructure expansion and equipment of HEST facilities;	· HEST research infrastructure assessments conducted and renewal plans developed · Fund for infrastructure rehabilitation and renewal established Private sector contributions to research infrastructure increase	· Extent to which the rolling programme of infrastructure and equipment targets are up to schedule Number of HEST facilities expanded/upgraded per year	· AFD · World Bank UNIDO PHEA
	Action 2: Support the establishment of infrastructure & equipment for STI	1. Establishment of appropriate infrastructure and equipment for establishment of innovation centres at select institutions	· Technology commercialization, dissemination institutions strengthened and/or developed	· Number of functional technology parks and innovation centres	· Tunisia · UNIDO · World Bank African Private Banks

Pillar III: Linking HEST and the Productive Sector

Time-Frame	Key Actions to meet challenges in the pillar	Constituent Activities	Expected Outputs	Indicators	Potential Partners (Identified during field visits and other operations)
Short-term	Action 1: Support for identification of national science, technology and innovation (STI) goals and priorities	1. Conduct national S&T needs assessments: map countries' economic and industrial needs and development goals against existing S&T human resources stocks and current S&T training capacity versus needed S&T human resources and needed skill mix (skills profiles) 2. Establish national and/or regional consultative dialogues on 3. S&T Priorities and Action Plan Setting to clarify/validate the relationship between S&T human resources needs and national/regional economic and industrial needs Support for conduct of periodic skills audits, labor market surveys	· Agreed framework for measuring and evaluating RMC's S&T capacity created · National S&T Human Resources Development Action Plans formulated · "African STI Capacity Map" and African Research and Technology Development Database	· Annual rate of production of National S&T HRD action plans · Endorsement of the data bases by RMCs and relevant continent-wide institutions like AU, NEPAD, ECOWAS, AAU	· NEPAD · UNESCO · AU Commission · AAU · World Bank · OECD · GLOBAL GOALS Ghana Rwanda · Mozambique · Nigeria · UNESCO · South Africa
	Action 2: Facilitate RMCs' articulation of linkage strategies between RMCs and international partners outside of Africa	1. Support studies to deepen understanding of global value chains for vertical capabilities strengthening and linkage creation in key sectors 2. Promote FDI and strategic alliances with partners in the Diaspora 3. Facilitate technology transfer	· Linkage strategies created in which STI partners are identified and measures to link up with global supply chains, access foreign technology, and develop partnership are articulated National strategies created for partnering and linkage with Africans in the Diaspora	· Increase in the number of strategic alliances with STI partners in national plans · Mobilisation of a dynamic corps of Africans in the Diaspora actively involved in partnerships	· World Bank · DFID · UNCTAD · NEPAD

Medium-term	Action 1: Increase HEIs' programs to strengthen industry-relevant, S&T key skills	1. Sponsor industry-academia curricula reform councils to formulate market-relevant and high quality curricula in S&T key skills 2. Address S&T key skills curricula reform at all educational levels—basic, secondary, and higher 1. Finance the development, launch and mainstreaming of teaching/training modules in entrepreneurship and S&T key skills at universities, polytechnics and TVET institutions	· Industry-academia curricula reform councils operational · Programs launched to fund firm-participation in industry-based training as part of S&T degree programs at HEIs · Increase in number of people in informal and formal sector accessing S&T key skills upgrading opportunities	· Extent of Increase in the number of training courses using block-release arrangements with industries · Annual statistics on the number of public and private sector workers having upgraded their skills	· UNIDO · UNCTAD · JICA
	Action 2: Invest in mechanisms to improve HEIs' quality assurance	2. Strengthen existing quality assurance agencies and support the emergence of such institutions (e.g., National Commission for Higher Education) 1. Establish or re-enforce national and regional accreditation systems as a means for monitoring and promoting quality among HEIs	· Quality assurance mechanisms improved · Accreditation systems strengthened and functional in a number of participating RMCs	· Equivalency of qualifications and accreditation within and across countries recognised	· World Bank · SIDA · Higher Education Authority of Ireland
Long-term	Action 1: Improve students' (particularly females) job-readiness through firm exposure (including sponsored programs for firm-based learning)	1. Support industry-based internship programs for students in HEIs through which firm-based learning is incorporated into the curricula 2. Provide mentorship and internship programs in S&T that target girls exclusively	· Potential private sector partners and models of partnership for increased industrial exposure of students in S&T programs · Projects launched to support industry-based internships/training in S&T · Female-focused mentorship programs launched	· Number of internships realised at various industries · Progressive increase in number of girls benefiting from internships	· Nigeria (STEPB Project) · Uganda · Namibia · World Bank · UNIDO · UNCTAD
	Action 2: Integrate indigenous knowledge into formal training and research programs	1. Support studies on: (1) the impact of indigenous inventions in local economies, (2) the role of teaching and research institutions in exploring and developing knowledge, (3) opportunities to mainstream indigenous knowledge in curricula at all education levels where appropriate, and (4) capacity needs for protection and, in some cases, commercialization of IK 2. Create a female-centered grants program for emerging female entrepreneurs; couple the grants programs with targeted opportunities for informal and formal skill upgrading for girls and women	· Curricula at post-basic levels reformed to integrate indigenous knowledge · Female-focused grants programs for emerging entrepreneurs	· Number of modules on indigenous knowledge developed and adopted into curricula · Number of eligible women entrepreneurs acceding to the grants programme.	· IDRC · Rockefeller Foundation · CGIAR/IFAD · DGIS · SIDA · World Bank

Outcomes of effective implementation of the ADB Strategy

It is widely agreed that the benefits to educational and S&T-related reforms do not accrue immediately but rather increase over time. Thus, immediate outcomes of effective implementation of the HEST Strategy would not be significant.
However, within 5-10 years of implementation, the outcomes listed below may be anticipated.

- Clearer picture of how science, technology, and innovation (STI) helps individual sectors, countries, markets, and regions meet their economic goals
- Each RMC equipped with a clear HEST vision, strategy, and action plan
- More capable HEST leadership, policy, and planning capacity
- Greater coherence between STI skills taught at primary, secondary, and higher educational levels and the needs of the market, private sector, and the informal sector (more opportunities for short-term, place-based training)
- More research projects, technology development projects and innovation initiatives in which partners from more than one sector involved (e.g., university, public, private, informal, regional COE, etc.)
- Greater coherence and responsiveness between donors' strategies and RMCs' national HEST strategies
- More participation of girls and women in higher education and in S&T-related education at all levels
- More and better infusion of S&T into products and processes (greater value-added, higher technology content of manufactures)
- More robust, maintained, and sufficient HEST infrastructure in RMCs (including ICT connectivity, laboratories and laboratory equipment, libraries, and classrooms)
- More articulated educational systems in which firm-based, informal, TVET, and university training are linked and unified in National Qualifications Frameworks and accessible to learners participating in lifelong learning
- Enhanced capacity of people, institutions, and countries to respond to change.

Annex 2

Indicative OSHD.2 Pipeline of Projects
2008-2010

N°	Country	Project Title	Amount (UA million)	
			ADF Grant or Loan	ADB Loan
2008 *				
1	Malawi	Support to Local Economic Development	14,00	
2	Namibia	Strengthening Service Delivery in Education System Through ICT	0,50 (MIC)	
3	Rwanda	Support to Science and Technology (KIST 2)	10,00	
4	Egypt	Smallholder Entrepreneurship Development (SDF III)		47,00
5	Kenya	Technology Vocational Education and Training	25,00	
6	Seychelles	National Capacity Building and Post Secondary Institution Study	1,00 (MIC)	
7	Swaziland	Youth Employment Creation Project		6,00
8	Burundi	Appui à l'Enseignement Supérieur et la Formation Professionnelle	1200 ,	
9	Guinée Equatoriale	Appui à l'enseignement Technique et Professionnel		40,00
10	Multinational	Support to the African University of Science and Technology	1200 ,	
11	ESW	STI Skills Profile (Central Africa)	0,50	
2009				
1	Bénin	Construction d'un Lycée Technique Agricole	20,00	
2	Sierra Leone	Rehabilitation of Fourah Bay College	20,00	
3	Burkina Faso	Appui au Centre d'Excellence des Métiers de l'Aéronautique	30,00	
4	Mozambique	Support to the Science and Technology Park	20,00	
5	Botswana	Support to TVET and Tertiary Science Education		30,00
6	Mauritanie	Renforcement de la Formation Technique et Professionnelle	20,00	
7	Cap Vert	Appui à la Formation Professionnelle	5,00	
8	Côte d'Ivoire	Réhabilitation des Grandes Ecole	50,00	
9	Gabon	Construction d'une Université Scientifique		50,000
10	Seychelles	Appui à l'Enseignement Supérieur et le Développement des Compétences		15,00
11	Ghana	Rehabilitation of the Engineering at the Kwame Nkrumah Institute of Technology		20,00
12	Mauritius	Support to Higher Education, Science and Technology		20,00
13	Tunisia	Projet d'Appui au Technopole de Sidi-Thabet		50,00
14	Zambia	Skills Development for the Mining Sector		20,00
15	Mozambique	Support to Science, Technology and Innovation	25,00	
16	Multinational	CEMAC – Appui à l'enseignement supérieur	20,00	
17	Multinational	Appui à l'Ecole Inter-Etat de Médecine Vétérinaire	25,00	
18	Multinational	Appui au Centre Régional d'Excellence des Technologies de l'Information et de la Communication	4000 ,	

19	Multinational	Support to Financial Management Services (INSEAD)		40,00
20	ESW	Science Commercialization and Convergence in Africa	0,30	
21	ESW	STI Skills Profiles (East Africa)	0,50	
2010				
1	Côte d'Ivoire	Appui aux Facultés Scientifiques des Universités de Cocody, Abobo-Adjamé et Bouaké		60,00
2	Madagascar	Appui à la Science et la Technologie – Recherche Maritime	10,000	
3	Angola	Skills Development for the Youth		25,00
4	Nigeria	Strengthening Vocational/Technology Training and Business Development Centres	50,00	
5	Liberia	Rehabilitation of the Faculty of Science	15,00	
6	Togo	Appui à la Formation Technique et Professionnelle	10,00	
7	Guinée	Réhabilitation des Facultés de Science et Technologie	2500 ,	
8	Namibie	Support to ICT Skills Development		15,00
9	Congo (Rép)	Réhabilitation de l'Université Marieme Ngouabi	20,00	
10	Guinée Bissau	Appui à la Formation et la Professionnalisation de la Fonction Publique	10,00	
11	Multinational	Appui à la Création d'un Pôle Régional en Gestion de des Services et Infrastructures Sanitaires	50,00	
12	ESW	STI Skills Profile (West Africa)	0,50	
13	ESW	STI Skills Profile (Southern Africa)	0,50	
14	ESW	STI Skills Profile (North Africa)	0,50	

**** All projects in the 2008 pipeline have been cleared by the country departments.***