

The African Network of Scientific and
Technological Institutions (ANSTI)

Strategic Plan of ANSTI: 2007–2011



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Abbreviations

AAU	Association of African Universities
ABN	African Biosciences Network
ACU	Association of Commonwealth Universities
ANSTI	African Network of Scientific and Technological Institutions
AU	African Union
COVIDSET 2005	First African Regional Conference of Vice-Chancellors, Provosts and Deans of Science, Engineering and Technology
DVC	Deputy Vice-Chancellor
FAOE	Federation of African Organization of Engineers
GC	Governing Council
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
ICT	Information Communication and Technology
JICA	Japanese International Cooperation Agency
NEPAD	New Partnership for African Development
R&D	Research and Development
S&T	Science and Technology
SET	Science, Engineering and Technology
SAUVCA	South African Universities Vice-Chancellors Association
UNECA	United Nations Economic Commission for Africa
UNESCO	United Nations Educational Scientific and Cultural Organisation
UNDP	United Nations Development Programme
USA	United States of America
VC	Vice-Chancellor

Executive Summary



Prof. Kwesi Andam
Chairman, Governing Council

In their meeting in Dakar, Senegal in 1974, the Conference of African Ministers responsible for science and technology in Africa (CASTAFRICA I) requested The United Nations Educational Scientific and Cultural Organization (UNESCO) to facilitate collaboration among African institutions with a view of fostering human resource capacity building in science and technology. After several consultations and discussions, the African Network of Scientific and Technological Institutions (ANSTI) was established by UNESCO in 1980.

Since its inception, the Network's fortune and programme activities have gone through many changes. Nonetheless it has remained focused on its overall goal of human resource capacity building while occasionally changing its programme strategies to suit both the available resources and the prevailing demand for its services. The current strategic plan is the latest effort to guide the Network in its effort to play an important role in the application of science and technology to development in Africa. This plan will guide the policies and programme of activities of the Network for the period 2007-2011.

The Plan has highlighted the achievements of ANSTI especially in the areas of training and the administration of various fellowship awards and other grants. Some of the achievements are:

- 74 staff of ANSTI member institutions supported for MSc and PhD courses in the last ten years;
- An average of 10 staff exchange awards each year;
- A big increase in the number of conference grants.

Analysis of the strengths, weaknesses, opportunities and threats has been carried out. This situation analysis drew on the information available on the state of science and technology institutions as well as information on the renewed commitment to science and technology by national governments, regional institutions and international donors. The analysis of this information identified many opportunities which the Network should harness in order to generate more funds and increase the impact of its programmes. The same analysis also highlighted threats to the success and effectiveness of the Network, including those arising from the weakness of its member institutions. The formulation of this strategic plan also included an in-depth examination of the Network and its management organ. This led to identification of inherent weaknesses and strengths. The strategic plan re-states the mandate, mission, vision and goals of the Network. Arising from the goals of the Network and guided by the results of the situation analysis, several strategic objectives have been identified and are presented in this document.

For the next five years, the Network will pursue the following six strategic objectives:

- (i) To facilitate and enhance interactions among member institutions.
- (ii) To facilitate training and research in science, engineering and technology.

- (iii) To promote the use of ICT in teaching and research in science, engineering and technology.
- (iv) To promote Gender Equity in access to science and technology training institutions.
- (v) To develop and disseminate scientific and technical information to address major socio-economic problems.
- (vii) To strengthen the Network.

The above objectives were carefully selected to ensure that ANSTI plays the role of a facilitator in the capacity building process rather than directly engaging in the training exercises. This will ensure that ANSTI's resources are utilized in a more effective and efficient manner.

The strategic plan has outlined activities that will be carried out in pursuance of each of the strategic objectives. A table presented at the end of this document gives the expected outcomes of the various activities.

The implementation strategy for the plan requires contribution from all components of the Network. The roles of the Secretariat, the Governing Council and the member institutions in the implementation of the plan, have been clarified. Furthermore, it is suggested that ANSTI develops partnership with existing Networks in order to achieve its strategic objectives. In this connection, it is recommended that the Network takes up the role of a Coordinator of the numerous organizations which are currently promoting science and technology in Africa. ANSTI's experience and size of its membership puts it in a strong position to provide leadership in such coordination activity.

The implementation of this strategic plan will ensure that:

- The visibility of ANSTI is increased especially as it enlarges the beneficiaries of its programmes through the promotion of the university-industry partnership. The ANSTI programme will have an impact not only on its members but also on industry and the economy as a whole.
- The programme offered by ANSTI member institutions will be more relevant to the national socio-economic development. The Network will provide a forum for regular exchange of experience, ideas on curricula reform and institutional governance including innovative management practices in S&T training institutions.
- The gender inequity in the list of beneficiaries of ANSTI programmes will improve.
- ANSTI member institutions and their graduates will be able to contribute to programmes for the attainment of the Millenium Development Goals (MDGs) especially the eradication of poverty and the fight against HIV/ AIDS.
- The Network will make significant contribution to staff development in science and technology training institutions. As a result, it will be a key player in the revitalization of higher education, science and technology institutions.
- A strong Secretariat with a full-time Coordinator will ensure an increase in contribution from members. A full-time Coordinator will provide leadership necessary for project development and fund-raising.

1.1 Historical Background

Founded in January 1980, by United Nations Educational, Scientific and Cultural Organization (UNESCO), the Network has grown over the years to become an effective institution for the development of human resource capacity in the fields of Basic and Engineering sciences. The Network was conceived in response to resolutions from the Conference of African Ministers of Science and Technology (CASTAFRICA 1) which was held in Dakar, Senegal, in January 1974.



Prof. J. G. M. Massaquoi
Coordinator, ANSTI

The original aim of the Network, which remained unchanged over the years, was to develop active collaboration among African scientific institutions so as to promote research and development in areas of relevance to the development of the region.

The Network has a total of one hundred and thirty nine (139) member institutions in thirty five (35) countries. Among the member institutions, is Daystar University, the first private institution to join the Network.

ANSTI emphasizes the pooling of resources available in the region so as to provide quality training and research in various scientific disciplines. In order to achieve this objective, ANSTI is engaged in numerous activities which can be grouped into four programme areas: Training; Seminars & Workshops; Publications; and Promotion of Research.

In the pursuit of the Network's objectives, lessons have been learnt and many milestones achieved. The following is a brief highlight of such achievements:

Between 1994 and 2005 ANSTI had, among other activities, provided different types of grants to two hundred and eighty-four (284) staff of member institutions; facilitated forty four (44) staff exchanges; granted seventy four (74) Postgraduate Awards; and provided seventy nine (79) Conference Grants to member countries.

ANSTI enjoys cordial relationship with many donors and other agencies. The Network has continued to enjoy growing visibility and received a major boost from the convening of the first African Regional Conference of Vice-Chancellors, Provosts, Deans of Science, Engineering and Technology (COVIDSET), in 2005.

1.2 The Institutional Framework of ANSTI

The Governing Council is the organ responsible for policy formulation and fund sourcing for ANSTI. It is made up of twenty one (21) members including representatives of ANSTI member institutions, The African Union (AU), United Nations Economic Commission for Africa (UNECA), UNESCO, Association of African Universities (AAU), UNDP, the Network's donors, African Biosciences Network (ABN), Federation of African Organizations of Engineers (FAOE), Female Scientists/ Engineers, and the host government. The Chairman of the Governing Council is elected by members of the Council and is normally affiliated to a member institution.

1.2.1 The Secretariat

There is a Secretariat/Regional Coordinating Unit (RCU) for administration, whose functions are to plan and organize programmes and activities for ANSTI. It coordinates, monitors and evaluates programmes. It is responsible for fund-raising for ANSTI activities. The Secretariat is headed by a Coordinator who is the Chief Executive Officer and legal representative of ANSTI. He is assisted by two (2) Secretariat staff.

1.2.2 Membership

Membership of ANSTI is open to all faculties, schools, institutes or equivalent units of degree awarding higher education institutions, as well as centres or institutes of research engaged in training and/or research in the field of physical and biological sciences, engineering and technology and located in Sub-Saharan Africa.

Associate membership is offered to institutions whose primary activities do not include scientific research or training but are involved in the promotion of the use of science and technology for development.

1.3.1 Training

Capacity building requires training and collaboration in research activities. Thus, ANSTI has several activities aimed at providing training and additional experience outside the scholar's home institution. The various elements of the training programme include: -

(a) Post-graduate Fellowships in ANSTI Institutions

ANSTI provides financial support to enable young scientists of member institutions to study in institutions outside their own country. The sponsorship covers all expenses including university fees, travel expenses and subsistence.

(b) Visiting (Staff exchange) Fellowships

Each year, about 10 to 12 academic staff members of ANSTI institutions are awarded grants to enable them to teach and do research in another ANSTI institution. This activity further enforces the collaborative objective of ANSTI.

(c) Short term training Fellowships

ANSTI also supports the participation of technical staff in short courses which it organizes. Such courses serve to continuously update the knowledge and skills of serving staff members of ANSTI institutions.

(d) Institutional Development

ANSTI has also tried to establish centres of excellence within the Network. These centers can be called upon to organize its different training activities. Host institutions of training programmes, especially those for the post graduate degree courses, are usually assisted in developing their capabilities for organizing and running the courses.

1.3.2 Seminars/Workshops

ANSTI promotes institutional and professional communication through the organization of workshops and scientific seminars. These meetings are organized for particular subject disciplines (e.g. Mechanical Engineering, Physics, etc).

1.3.3 Promotion of Research

When funding situation permits, the Network awards grants for research. Every effort is made to identify institutions and individuals who have the capacity to do research. Furthermore, ANSTI ensures that the research is relevant to the socio-economic development of the Region. Collaborative or regional research projects are encouraged.



1.3.4 Publications

ANSTI regularly produces several categories of publications which are circulated among its member institutions. The following are the three categories:

(a) ***The African Journal of Science and Technology.***

This is the most important publication of ANSTI. The journal has a very favorable reputation among African scientists as can be judged from the influx of articles both from within and without the region.



(b) ***Directories***

These include the directory of institutions and individual scientists (e.g. Directory of Women Engineers).



(c) ***Occasional reports***

The Network also circulates to its member institutions reports on meetings on strategic issues and articles that are relevant to Science and Technology.



1.3.5 Information Dissemination

ANSTI uses different types of Information and Communications Technology (ICT) to disseminate a wide range of information. These include an electronic Newsletter, a website, an Internet portal and electronic broadcast using an e-mail mailing list. The ANSTIWEB Portal serves as a big bulletin board for scientific activities relevant to the continent.

1.4 Strategic Plan of ANSTI (2007-2011)

The sustainability and growth of ANSTI require a strategy. The need to coordinate the various actors and institutions and to respond, in a focused manner, to regional and global challenges, requires that a holistic strategy be developed in consultation with the stakeholders. The Governing Council mandated the Secretariat to formulate this strategy. The result, presented in this document, is the Strategic Plan of The African Network of Scientific and Technological Institutions for the period, 2007 - 2011.

Situational Analysis

2.1 Analysis of strengths, weaknesses, opportunities and threats (SWOT)

In formulating the objectives of ANSTI, an assessment of both the external and internal environment was made. This involved the assessment of strengths and weaknesses to ascertain the capability of ANSTI as well as the opportunities and threats facing the Network.

2.1.1 The External Environment

The assessment of the External environment involved the analysis of the opportunities available and the threats facing ANSTI.

(a) *Opportunities*

The following were identified as the key opportunities available to ANSTI. The Network should ride on the crest of the wave of these events to develop its strategic objectives.

- **Demand for Science, Engineering and Technology (SET) services**
The emergence of global liberal economic practices, as advanced by proponents of globalization, has created pressing issues for the region and its institutions. Although the region is endowed with much mineral and other material resources, the exploitation and processing of these resources require the application of advanced scientific and technological know-how. Africa has not sufficiently developed such capacities and has to work with those with such capacities. The conversion process is done abroad and Africa imports the finished products at prices that do not compare favorably with her receipts.

In order to reverse this sad state of affairs, there is need to expand higher education, especially training in science and technology, in order to create a pool of technically qualified people for service industry. Processing of materials locally, would create opportunities for the growth of new industries and hence more opportunities for employment, technological innovations, technology diffusion and research.

- **Need for Capacity Building in the Universities**
The demand for trained manpower in the region is high due to existing skills gap in many areas, and especially in SET. While the demand for education has been on the increase, the region's economies have been on decline making it difficult to satisfy the demand for quality education. Exacerbated by pressures from other societal needs, education receives only a fair share of resources available. This has led to low level of funding for higher education resulting in the provision of poor and inadequate learning materials, text books, library facilities and laboratories. The quality of higher education is in decline as large numbers of students are made to compete for limited resources. Furthermore, an analysis of the available staff in most institutions in the region confirms that several of them are understaffed. There is need to train more scientists at the level of PhD in order to provide staff and revitalize the S&T training institutions. This is clearly a role that ANSTI can perform.



- **Brain Gain**

Some sources indicate that there are more African scientists and engineers working in the USA than there are in the entire African continent. These scientists have acquired knowledge, experience and financial resources that the region needs for its development. Opportunities exist for the repatriation of scientific knowledge, through the use of ICT to tap into the skills of members of the Diaspora, and through the creation of a conducive environment to attract temporary or permanent migration of members of the Diaspora.



- **ICT Development**

The development of Information Communications Technology (ICT), in recent years, has led to momentous growth of industrial and commercial enterprises. ICT use has led to reduction in the cost and increase in the speed of communications across the globe, abolishing pre-existing barriers of time and space, and affecting all areas of social and economic life. Rapid advances in technology and the diminishing cost of acquiring the new ICT tools have opened new windows of opportunity for African countries to accelerate their economic growth and development. It has also positively affected the cost of administering Networks. Members of African Networks can use the ICT infrastructure to overcome the inherent weaknesses in the traditional national communication systems. Networking can now be faster and cheaper.

- **Growth of Partnerships**

Many sub-regional, regional and international networks in higher education are active in the region. This creates an opportunity for collaboration. To build their capacities, many universities have also initiated or strengthened inter-university collaborations, both with institutions in Africa and outside. ANSTI can position itself to benefit from this trend and extend its links to other institutions and Networks.

- **A global renewal for Science Engineering and Technology (SET)**

The development of SET has accrued benefits to governments, industry and society at large. At a time when jobs are shrinking in many sectors, there is an upsurge of business and employment opportunities in development and exploitation of SET-driven initiatives. Thus, institutions like ANSTI whose goal is to build human resource capacity in science, engineering and technology have great relevance in the modern economy.

- **Filling the SET scholarly publications Gap**

The countries and institutions in the region have not given due attention to scholarly publications. There are a few science and engineering textbooks or learning materials available in some institutions. There are even fewer journals. There is, therefore, a big gap to be filled in order to reduce the shortage of SET scholarly publications.

- **Addressing Gender inequality**

The number of women and other disadvantaged groups in science is low at all levels and more so in the higher ranks. Factors contributing to these disparities include negative social attitudes, which promote the idea of

SET for men, while consigning women to motherhood-friendly courses and careers, and the lack of gender sensitive policies. There is need, therefore, at government and societal levels, to remove barriers that inhibit women's mobility into higher education and especially into science.

- **Development of Database of scientists**

The region does not have a database of scientists. With an active database it would be possible to share and to recruit, cheaply, available expertise.

- **Visibility of ANSTI**

As a result of its SET work with Regional governments, institutions, Donors and other Networks, ANSTI has over the years raised its visibility. In this respect, a lot of ground was covered as a result of the convening the COVIDSET 2005 in Accra, Ghana. The Network can build on the opportunities derived from this high visibility.

- **Potential Membership**

As the demand for education in the region increases, so does the need for more institutions. Many new universities with SET faculties are being established in the region. All of them are potential ANSTI members.

- **The development of Engineering sciences**

The Region has not given SET the attention it deserves. The countries in the region and universities have not fully exploited the opportunities available through use of SET in development. The region's governments should be encouraged to put more resources in the development of SET in order to realize accruing benefits.

(b) **Threats**

The following were identified as the key threats facing ANSTI:

- **Brain Drain**

The challenges facing higher education in the region are exacerbated by the loss through attrition of its manpower, a process commonly referred to as brain drain. The region loses a lot of its educated and most useful manpower to the developed world. Data about the magnitude of the problem is not available. It is, however, known that the number is high enough to cause concern. Such outflow of human capital has a serious impact on national development efforts and the capacity of higher education institutions to fulfill their missions. It also weakens the capacity building process of ANSTI.

- **Poor ICT infrastructure and policies**

In Africa, poor ICT infrastructure combined with weak policy and regulatory framework and limited human resources has resulted in inadequate access to affordable telephones, broadcasting, computers and the Internet. Service costs are also high. Most universities' efforts to access and utilize ICT have been constrained by lack of capacity (infrastructure, human and financial) and unfavorable policy environment. The weakness is likely to affect ANSTI'S effort in information



dissemination, delivery of SET education and human resource capacity building.

- **Dwindling Resources**

The demand for SET services in the region, as mentioned elsewhere in this document, is growing. The same cannot be said about the inflows of resources. Governments in the region are constrained of resources and have to contend with pressing social and political issues at a time of reducing donor interest and fatigue. ANSTI member institutions will find it difficult to make contributions of financial and other resources to the Network.

- **HIV/AIDS**

Dealing with HIV/AIDS, especially in higher education institutions, presents the region with formidable challenges. The devastating impact of the HIV/AIDS pandemic on higher education includes the death of teachers, students and administrators, increase in workload, frequent teacher absenteeism and intermittent student attendance (due to illness or care for family members), low teacher and student morale, a rise in university expenditure (due to missed classes, lost investment in staff and students, and high health service costs), a decline in quality of education, and a fall in the number of graduating students. ANSTI's staff development programme will be under threat from several directions.

- **Poverty and poor economic performance**

Poverty is a pervasive regional problem and presents formidable challenges. Poverty undermines the ability of students to access learning materials. It affects the quality of the training offered in ANSTI member institutions.

Poor national economic performance and poverty of the students will affect the income of ANSTI member institutions and their ability to pay the membership dues.

- **Shortage of specialist SET Personnel**

The recruitment and retention of qualified personnel is made difficult by brain drain and low enrollment in postgraduate education in science. This shortage affects, not only, the numbers available for the basic SET areas of teaching and research, but also seriously reduces the availability of specialists in many fields such as policy drafting and other.

- **Recognition by Governments in the Region**

The role and importance of SET in national development has not been recognized by all Governments in the region. However, it is worth noting that a few governments have realized the importance of SET and have established ministries specifically for SET in their structures. The challenge is to allocate enough resources commensurate with its importance.

- **Languages of Members**

The region suffers from a diversity of languages. The languages of instruction in the institutions in the region are those of former colonial

masters, i.e. English, French and Portuguese. That makes interaction and communication difficult and expensive. The administrative costs of ANSTI resulting from this could threaten the future of the Network.

2.2.2 The Internal Environment

The assessment of the internal environment involved the analysis of the strengths and weaknesses of ANSTI.

a) *Strengths*

The following were identified as the key strengths of ANSTI:

- **The History - Foundation and Mandate**

The historical background of ANSTI shows that it was created in response to demand by Africa Ministers responsible for Science and Technology (CASTAFRICA 1). Hence one could say that the Network was given a mandate by African Governments.

- **ANSTI Experience**

In its twenty five years, the Network has established itself as a champion for development of human resource capacity in the fields of SET. The Network has, through enhanced usage of ICT, successfully brought together one hundred and thirty nine (139) institutions in thirty five (35) countries of the region. The Network has accumulated unmatched experience in the administration of conference grants and fellowships. For example, between 1994 and 2005 ANSTI had, among other activities, provided grants to two hundred and eighty- four (284) staff of member institutions, facilitated forty four (44) staff exchanges, granted seventy four (74) Postgraduate Awards and provided seventy nine (79) conference grants to member countries.

- **The Secretariat**

The Secretariat/Regional Coordinating Unit (RCU) is a small but effective unit whose functions include, but not limited to: planning and organizing programmes and activities for ANSTI; coordinating, monitoring and evaluating programmes; proposing and developing ideas, innovative mechanism for generating funds for operationalization and sustenance of ANSTI activities.

- **Size of its membership and the geographical coverage**

The membership of ANSTI is wide and well spread within the region. There is a growing interest to join the Network. In 2005, and for the first time, a private university applied to join.

- **Publications**

ANSTI is a leader in the dissemination of scientific information in the region using the electronic media. ANSTI produces four groups of publications: The African Journal of Science and Technology, which is the Network's flagship publication; a quarterly Newsletter, which carries information on activities of the Network as well as other scientific activities in the region and several reports and studies.

- **UNESCO Affiliation**

The First Conference of Ministers which led to the birth of ANSTI was convened by UNESCO with collaboration of OAU and ECA in Dakar, Senegal, in January 1974. UNESCO has continued to support the Network in its programme activities. It hosts the Secretariat and provides the Coordinator. This association strengthens ANSTI's capacity, visibility, and standing among partners and donors.

- **Broad based and experienced Governing Body**

ANSTI is governed by a Governing Council which is the organ responsible for policy formulation and fund sourcing. The Council is made up of a broad based membership comprising of eminent SET practitioners, representatives of international organizations, donors to the Network and the host country.

- **Financial Management**

ANSTI receives fees from members and, grants and donations from donors and partners. An account for membership fees is maintained by UNESCO in Paris on behalf of the Network. Its accounts are externally audited bi-annually and presented to the members and partners.

(b) **Weaknesses**

The following were identified as the key weaknesses of ANSTI:

- **Resource mobilization**

The demand for ANSTI and SET services in the region as mentioned elsewhere in this document, is growing. The same cannot be said about the inflows of resources to the Network. ANSTI lacks the capacity to undertake sustained campaigns that are necessary to mobilize adequate resources.

- **Low membership**

The region is expansive with over three hundred institutions in SET field, out of which, only one hundred and thirty nine are ANSTI members. A higher membership would mean more visibility, interactions and more fees for the Network.

- **Uncommitted Membership**

ANSTI membership stands at 139 institutions. Many of these members are not up-to-date with payment of their membership fees. Institutions and organizations are respected by outsiders on the basis of the value their members are seen to attach to them.

- **Weak Secretariat**

The Secretariat is the nerve centre of the Network and is responsible for planning, organizing, coordinating, monitoring and evaluating programmes. These are all major activities of the Network. The Secretariat is headed by a Coordinator who is assisted by two (2) support staff. The Coordinator is a staff member of UNESCO and holds a full time position with the organization. The members require constant follow-ups in order to pay

their fees. The Secretariat, as presently constituted, lacks the capacity to institute measures and follow-ups to make the members pay up.

- **Relevance**

The Network's activities benefit institutions and it is therefore very visible at the institutional level. However, its impact is not felt at the national level. To be able to contribute to national development it must encourage its member institutions to forge links with local industries. This will help in national visibility and fund-raising.



Governing Council members and Secretariat staff (2006)

Chapter 3

Strategic Objectives

3.1 Focusing on ANSTI's Future

The original goal of ANSTI was to build a high-level human resource capacity to undertake research and training in science and technology. While a lot has been done in the last twenty five years of existence of the Network, a lot more remains to be done. In the past two decades, there was a marked reduction in the financial support for higher education in the region. This led to a near collapse of Higher Education in the region. The problem is particularly severe for science-related courses. Fortunately, the situation has now changed. The national economies are growing. The development partners now recognize the importance of scientific and technical human resource capacity. More investments are now destined for higher education institutions. For ANSTI and its partners, the thrust should now focus on meeting demands of the changing regional and global environment in order to develop the human resource capacity in science and technology in the region. This approach will be guided by a clear vision and sense of purpose.

3.2 The ANSTI Mandate

The First Conference of Ministers responsible for the Application of Science and Technology to Development in Africa (CASTAFRICA 1) convened by UNESCO held in Dakar, Senegal, January 1974, emphasized the need to promote human resource development by enhancing collaboration among universities on the continent through a Network of institutions of Science and Technologies. Arising therefrom the African Network of Scientific and Technological Institutions (ANSTI), was established to operate and function in accordance with its constitution. ANSTI is an autonomous non-governmental African organization with perpetual succession and a common seal, free to seek support from governments, private enterprise and international bodies.

3.3 The Vision of ANSTI

The Vision is the strategic intent, the desired future of the institution. The Governing Council and Secretariat are committed to the creation of a successful institution. The vision of ANSTI as articulated and agreed by stakeholders is: *To become a major institutional player in the process of human resource capacity building in Science, Engineering and Technology in Africa.*

3.4 The Mission of ANSTI

The Mission is the over-riding reason for the existence of the institution. The agreed mission of ANSTI is: *To facilitate active collaboration among African Scientific institutions for the purpose of training and research in Science, Engineering and Technology.*

3.5 The Goals and Objectives of ANSTI

The ultimate development objective of ANSTI is to strengthen the region's capacity for training and research and for establishing services for intensive and purposeful utilization of science, engineering and technology for development. The specific objective is to support the process of human resource capacity building in relevant areas of science and technology.

ANSTI, in pursuance of the specific objective will aim to advance six key strategic objectives. These are:

- To facilitate and enhance interactions among member institutions;
- To facilitate training and research in Science, Engineering and Technology;
- To promote the use of ICT in teaching and research in Science, Engineering and Technology;
- To promote Gender Equity in access to science, engineering and technology training institutions;
- To develop and disseminate scientific and technical information to address major socio-economic problems; and,
- To strengthen the Network.

The achievement of these goals will address the challenges and take advantage of the opportunities identified in Chapter Two of this plan. These objectives are further detailed below and also summarized in *Chapter 5*.

3.5.1 STRATEGIC OBJECTIVE 1: To facilitate and enhance interactions among member institutions



Former DAAD Regional Director for Africa, Mr Etzold with Prof Massaquoi, ANSTI Coordinator during the handing over of a grant to ANSTI

ANSTI will need to organize more interventions, similar to COVIDSET 2005, in order to create opportunities for leaders of institutions to discuss and explore opportunities for linkages, resources sharing, review and harmonization of curricula, and other matters of mutual interest. Such interventions could also be used to bring together professors from the Diaspora and institution leaders in the region to explore ways of joint collaboration and assistance. ANSTI is best suited to build and maintain a data bank of experts in the region and from the Diaspora, who if conditions permit, would be available for short or long term assignments in universities in the region.

ANSTI can also facilitate information sharing on teaching and learning materials available for use in the region. This will mitigate the problem of lack of textbooks. To this end, the following activities will be undertaken:

- Organization of bi-annual forum of university leaders responsible for science and technology training.
- Development of data bank of scientists in the region and the Diaspora.
- Establishment and maintenance of websites.

3.5.2 STRATEGIC OBJECTIVE 2: To facilitate training and research in Science, Engineering and Technology

ANSTI will facilitate training in Basic and Engineering Sciences in the region. This will be undertaken through various training programmes including the award of: Post-graduate Fellowships in ANSTI institutions; Visiting (Staff Exchange) Fellowships; Short term training fellowships and grants for institutional development.

In addition, ANSTI will facilitate the training process by providing information on centers of excellence and other fellowships available to African scientists.

The Network will serve as a link between fellowship administrators and scientists in ANSTI member institutions.

In order to expand the opportunities for member institutions, the following activities will be undertaken:

- Create Centres of Excellence Directory;
- Link Donors with staff /member institutions for Postgraduate Fellowships;
- Facilitate mobility within Region and the Diaspora;
- Strengthen training and research in emerging areas of science and technology;
- Strengthen the award and administration of grants.

3.5.3 STRATEGIC OBJECTIVE 3: To promote the use of ICT in teaching and research in Science, Engineering and Technology



Two major problems facing most African universities in the area of science and engineering fields is the scarcity of books and skilled manpower. ANSTI will pursue the objective of promoting the use of ICT in teaching and learning of science and engineering courses in order to reduce the effects of these problems. The main activity under this objective therefore will be the training of university staff to enable them convert lecture notes to interactive e-learning format. ANSTI will also produce and distribute several e-courses in basic and engineering sciences.

In undertaking the following activities, ANSTI will have contributed to the strengthening of institutions in the region:

- Create an ICT capacity Directory;
- Organise seminars/ conferences and Support Virtual laboratories;
- Organize e-content training programs;
- Support the development of e-content in SET.

3.5.4 STRATEGIC OBJECTIVE 4: To promote Gender Equity in access to science engineering and technology training institutions

Analysis of the composition of human resource capacity in science and technology in Africa shows that there are still very few women scientists in research and academic careers.

There is a case for taking deliberate measures to bring in more women and the disadvantaged into ANSTI programmes. An increase in the entry age limit for eligibility and the introduction of affirmative award programmes would help to address the present imbalance.

In order to expand the opportunities for women and address the existing imbalance, the following activities will be undertaken:

- Mainstream women in all activities in Strategic Objective 2;
- Create Gender Specific Awards in SET. These are awards which will be available only to women.

- Organize conferences and workshops to address Gender issues in SET;
- Establish a SET database of profiles of successful women in SET.
- Commission studies to inform policies on Gender in SET.

3.5.5 STRATEGIC OBJECTIVE 5: To develop and disseminate scientific and technical information to address major socio-economic problems

Universities and other institutions have a big challenge of redesigning their curricula to meet the demands of the knowledge economy. ANSTI can play a major role by facilitating the process of making SET training more relevant to socio-economic development.

Institutions of higher learning are expected to produce not just job seekers but also job creators. Unemployment is one of the causes of poverty. It will be useful for the purpose of enterprise development and job creation for graduates of institutions in the region to be empowered with entrepreneurial skills. Entrepreneurship is a great source of employment and wealth creation. The challenge is to provide training that is internationally acceptable and locally relevant. Most institutions are at present unable to play important roles in poverty eradication because the academic programmes are inappropriate and the students are not sufficiently exposed to practical experience. The latter is due to the weak industrial base of most countries in the region.

The HIV/AIDS pandemic remains a key concern for the region. The region's HIV/AIDS prevalence rate is the highest in the world and affects all age groups, and particularly those aged between 15-49 years. ANSTI will work with other partners to disseminate information on low cost therapies and other science-based initiatives.

These will be achieved through the following:

- Strengthen the ANSTI journal and other scholarly publications;
- Facilitate and promote the development of Entrepreneurship curricula;
- Solicit input from researchers on HIV/AIDS;
- Facilitate Publications on Poverty and HIV/AIDS;
- Convene conferences with Poverty and HIV/AIDS themes.

3.5.6 To strengthen the Network

To effectively implement the strategic initiatives proposed by its stakeholders and documented elsewhere in this document, ANSTI will need to be strengthened. The Secretariat, as presently constituted, lacks the capacity to carry out the expected tasks. The Secretariat is currently headed by a UNESCO staff that has other assignment in UNESCO. There will be need to hire a full time officer to carry out the activities of ANSTI.

In order to be strong, ANSTI needs to continuously enlarge its membership and ensure existing members pay annual membership fees.

Membership fees is the lifeline of a network and gives it visibility and recognition. Strategies to recruit new members and to collect outstanding

fees will need to be put in place in order to grow and sustain the Network. To be able to do so, it will be necessary for the Network to have a full-time Coordinator as soon as possible.

In order to strengthen the Network, the following will be undertaken:

- Collect outstanding fees.
- Recruit new members.
- Seek more funds to meet increased demand.
- Recruit a full-time Coordinator.

Implementing Strategy

The implementation of the proposed plan will require contribution from various components of the Network as well as its partners. The task of the Secretariat will be to ensure that each of these key players perform their role. The Coordinator will mobilize the services and resources available in the Secretariat, member institutions and partners.

4.1 ANSTI's Capacity

The ANSTI Secretariat is an important organ of the Network and is central to the implementation of strategic initiatives proposed by stakeholders and presented elsewhere in this document. The Secretariat, as presently constituted, lacks the capacity to carry out the expected tasks. There will be need to hire a full time officer to carry out the activities of ANSTI or alternatively cede some of the tasks for execution elsewhere.

4.2 Role of Member Institutions

ANSTI member institutions are independent institutions which support the ANSTI objective: *to build a high-level human resource capacity to undertake research and training in science and technology*. They make available to ANSTI institutional facilities on such terms and conditions as may be agreed upon with the competent organs of ANSTI.

4.3 Resource Mobilization and Partnership

ANSTI works in collaboration with NGOs and other agencies. Many have shown interest in using ANSTI to implement some of their programmes particularly those related to postgraduate fellowships, the administration of small grants to African institutions and organisation of Regional meetings of scientists.

Several other agencies involved in the support of higher education in Science and Engineering have in the past either supported ANSTI programme of activities or have used the ANSTI Network to implement their own programmes. They include UNESCO which established ANSTI in 1980. UNESCO has continued to provide financial and technical assistance to ANSTI. UNESCO houses the Network Secretariat in its Nairobi Office and has since 1993 provided the Coordinator on a part-time basis.

The current sources for funds for ANSTI activities are UNESCO, the German Academic Exchange Service (DAAD), The Dutch Government, The United Nations University, and the contribution from member institutions.

The demand for trained manpower, especially in SET, will remain high due to developmental needs of the region and its present low stock of skills. Many of the above regional development partners, will be implementing projects some of which will fall within ANSTI areas of operation. ANSTI has capacities and an elaborate network which could be used to implement related services. ANSTI Secretariat should exploit this prevailing good will in the international community to mobilize resources and forge partnerships for ANSTI programmes.

4.4 Facing the Future

In its endeavor to implement its Strategic Plan, ANSTI will continue to work with existing networks and to also open new linkages. Effort will be directed towards the improvement of services to existing members and the recruitment of new ones.

There are now many Networks in the region dealing with higher education. ANSTI will open channels of communications with other Networks for the mutual benefit of all parties. ANSTI is in a vintage position to help many of them use its institutional experience in delivering services, in the SET field. The region is vast and needs a lot of assistance in order to build the capacities needed. Collaboration among players can only add value to this cause. To consolidate the gains of past and move gallantly into the future, ANSTI will lead the way in the following areas:

4.4.1 Leading the Networks

Many players who are concerned with the development of the region now realize the importance of SET in the development process. Efforts are being expended to address the neglect of the past. As a result, there is increased level of activity for the promotion of science and technology. Several NGOs, networks and other agencies have sprung up. ANSTI, using its present regional coverage can foster wider linkages to promote the case for SET. Furthermore, ANSTI's experience and membership gives it good standing in SET field. ANSTI can take a leadership and coordinating role among these networks and agencies.

4.4.2 Brain Drain

Many of the strategies to contain the out migration of talent may be outside the mandate of ANSTI and its collaborators. ANSTI can, however, lead other networks and agencies in identifying opportunities for the use of ICT for tapping into the skills of members of the Diaspora. This should go a long way in slowing down the effect of this threat.

4.4.3 Information and Communication Technology

An important strategy which ANSTI must employ in the implementation of its future programme is to rely on the use of ICT for the implementation of its programme. This will include information dissemination and the strengthening of the member institutions capacity to deliver science and engineering education. In this connection, the strengthening of the ICT infrastructure of its member institutions should be pursued either directly or indirectly.

Objectives, and Activities to support the Strategic Plan of ANSTI

No.	Objective	Activities	Time period	Responsibility	Expected Outcome
1.	To facilitate and enhance interactions among member institutions.	1.1. Organization of bi-annual forum of university leaders responsible for S&T training	2007 - 2011	GC/Secretariat	Bi-annual meetings held
		1.2. Development of a data bank of scientists in the Region and the Diaspora	June 2007	Secretariat	A Directory of Regional Scientists
		1.3. Establishment and maintenance of websites	June 2007	Secretariat	Websites Established
2.	To facilitate Training and research in SET.	2.1. Create Centers of Excellence Directory	June 2007	Secretariat	Awareness of capacity availability
		2.2. Link Donors with staff/member institutions for Postgraduate fellowships	2007 - 2011	Secretariat,	More fellowship awards
		2.3. Facilitate mobility within Region and the Diaspora	2007 - 2011	GC/Secretariat	More interactions
		2.4. Strengthen training and research in emerging areas of science and technology	2007 - 2011	Secretariat/ member institutions	More research areas
		2.5. Strengthen the award and administration of grants	2007 - 2011	GC/Secretariat	Strengthened award administration

No.	Objective	Activities	Time period	Responsibility	Expected Outcome
3.	To promote the use of ICT in teaching and research in SET	<p>3.1. Create an ICT capacity Directory</p> <p>3.2. Organise seminars/conferences and support Virtual laboratories</p> <p>3.3. Organize e-content training programs</p> <p>3.4. Support the development of e-content in SET.</p>	<p>2007</p> <p>2007- 2011</p> <p>2007- 2008</p> <p>2007- 2011</p>	<p>Secretariat</p> <p>Secretariat/ Member institutions</p> <p>Secretariat</p> <p>Secretariat/ Member institutions</p>	<p>Increased awareness</p> <p>Seminars/Virtual Labs set up</p> <p>More e-courses in SET.</p> <p>Increased use of e-content courses.</p>
4.	To promote Gender Equity in access to SET Institutions training	<p>4.1. Mainstream women in all activities in Objective 2</p> <p>4.2. Create Gender Awards in SET. These are awards that will only be available to women</p> <p>4.3. Organize conferences and workshops to address Gender issues in SET</p>	<p>2007-2011</p> <p>2007- 2011</p> <p>2007-2011</p>	<p>GC/Secretariat</p> <p>GC/Secretariat</p> <p>GC/Secretariat</p>	<p>More awards to women</p> <p>Gender Awards in place</p> <p>Conferences/ Workshops held</p>

No.	Objective	Activities	Time period	Responsibility	Expected Outcome
4.		4.4. Establish a SET database of profiles of successful women in SET	2007-2008	Secretariat	Gender success Story directory
		4.5 Commission studies to inform policies on Gender in SET	2007- 2011	Secretariat	Gender studies Reports
5.	To develop and disseminate scientific and technical information to address major Socio-economic problems.	5.1 Strengthen ANSTI Journal and other scholarly publications	2007-2011	Secretariat	
		5.2. Facilitate and promote the development of Entrepreneurship curricula	2007-2011	Secretariat	Curriculum Developed
		5.3. Solicit input from researchers on HIV/AIDS	2007-2011	GC/Secretariat	HIV/AIDS Awareness increased
		5.4. Facilitate Publications on Poverty and HIV /AIDS	2007-2011	Secretariat	Poverty and HIV/AIDS journal articles
		5.5. Convene conferences with Poverty and HIV/ AIDS themes	2007-2011	Secretariat	Conferences on Poverty and HIV / AIDS held

No.	Objective	Activities	Time period	Responsibility	Expected Outcome
6.	To strengthen the Network	6.1. Collect outstanding fees	2007	GC/Secretariat	More members in good standing
		6.2. Recruit new members	2007-2008	GC/Secretariat	Increased membership
		6.3. Seek more funds to meet increased demand	2007-2011	GC/Secretariat	More funding
		6.4. Recruit full-time Coordinator	June 2007	GC/Secretariat	Full time Coordinator in place