Developing Knowledge Infrastructure and Networks for Sustainable Development

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Role of science and technology

Science and technology:

• Play a critical role in meeting social, economic and environment goals and objectives of sustainable development

• have become indispensable inputs into a country’s economic, social and environmental development

• are acknowledged as among the chief drivers of the fast evolving globalisation process
Role of science and technology cont

- Advances and innovations in science and technology and knowledge gained from these have had profound impacts to the society as a whole and to individual members of the society, in diverse areas such as agriculture, business, commerce, communications, culture, education, energy, medicine, meteorology, and transportation.
Role of science and technology cont

Knowledge:

• is a critical input for global change
• has played a crucial role in a country’s economic development - particularly so in developed countries.

In Africa:

• there is an acute lack of appreciation of the importance of knowledge to national development
• existing knowledge infrastructures networks in Africa are inadequate for the task before them
Knowledge infrastructures

- Schools, colleges, universities and research institutions
- Information and Computer technologies and infrastructures;
- Journals and books
- The media – print, radio and television,
- Institutions for collection and analysis of data, data and information processing and dissemination
- GIS
Current situation in Africa

Characterised by:

• Limited access to scientific information and knowledge
• Poor knowledge infrastructure
• Limited use of knowledge to help solve emerging problem and to achieve national sustainable development goals
• Meagre information / knowledge networks
• Inadequate reservoir of expertise in science and technology and in knowledge base development and management
• Limited capacity to analyse, process and disseminate information and knowledge, including the preparation of studies and reports
• Inadequate awareness and appreciation of the importance of scientific knowledge
• Lack of commitment
• Lack of knowledge policy
Developing knowledge Infrastructures and networks

Required actions discussed relate to:

- schools, colleges and universities and research institutions
- journals and books
- media
- information and communications technologies.
Other areas requiring attention

- Enhanced awareness of science and technology
- Capacity development and institutional strengthening
- Developing and strengthening African knowledge networks in science and technology
- Allocation of resources for scientific and technical research
- International co-operation
- Funding and investment
Other areas requiring attention cont

• Improving job opportunities for science and engineering graduates and
• Development and implementation of suitable knowledge policy.
Schools, colleges and universities and research institutions

• constitute a crucial infrastructure that must be developed and strengthened

• Also need to develop in these institutions leadership in the promotion of knowledge management as well as to improve information infrastructure

• The facilities should be upgraded and modernised so that the students and researchers can keep abreast of the latest developments.
Schools, colleges and universities and research institutions cont

- Generate increased interest by students in science and technology so that they pursue them in schools, colleges and universities and choose careers in these areas.
- Once they opt for the subjects, the approach for instruction should be such as to stimulate and maintain their interest in the subjects.
- Produce, adopt and implement educationally sound instructional material of uniformly high quality.

Teachers are crucial link
Schools, colleges and universities and research institutions cont

- train and retrain well in teachers science and technology subjects and knowledge transfer
- Institute effective logistical support for teachers

Aim: ensure genuine understanding of science and technology subject matter
Journals and books

Journals have a critical role to play:

- In the flow of science and technology knowledge
- Invaluable vehicle for generating awareness of science and technology issues and problems

In Africa the issue of access to journals is not trivial:

- Near or complete absence of these journals in the libraries even at the national universities.
- Lack of or inadequate electronic access to the journals.

Additional resources required:

- To improve access to journals and books
- Train library personnel in the latest advances in library science.
Confine my comments to books on science and technology.

- Many books have been written on a staggering range of topics
- Some of these books are aimed at a wide audience, the general reader
- They have succeeded in discarding the jargon and technical complexities, without sacrificing the clarity of explanation of the basic mechanisms involved.

Access to books in African countries is limited thus constraining the flow of knowledge to those who need it and stand to benefit the most from it.

There is an urgent need for massive effort to address and contain the situation
Media

Many newspapers have created sections on science and technology to provide exciting knowledge on science and technology.

Information:
- widely disseminated
- constitutes a valuable means of transferring science and technology knowledge.

The effort should be expanded.

The quality of reportage in existing sections should be improved and more of such coverage provided on a regular basis.
Radio:

- Reaches far and wide
- Has spread to almost every corner of the countries in Africa
- Can be an effective medium and tool in diffusing information and knowledge

But not all schools are covered. More effort is required to reach that goal. Also encourage the general public to listen to radio talks and lectures on science and technology.
Media cont

- Television is the major medium for scientific and technological information and knowledge transfer in the developed countries,
- Good programmes on science and technology
- Some, e.g. Nova, Nature, the Discovery Channel, National Geographic Channel, devote full channels on specific topics on science and technology.

But in Africa television is still a luxury

Strong case should be made on introducing or expanding such programmes
Information and communications technologies

Telephones are a good medium of communications. Infrastructure is still very poor in Africa. Landlines are inadequate for most purposes. The equipment is old. The cost of connection and use is inordinately high. All shortcomings must be addressed to improve the quality of knowledge transfer.

The cell phones have significantly transformed telecommunications. However, need to increase connectivity between the different operators within a country and reduce the cost of use as well as connection to land lines or different operators.
Information and communications technologies cont

Internet infrastructure in many countries is meagre or absent. Internet access is still unreliable and connectivity pitiable.

Other problems:
- unreliability or lack of electricity
- inadequate number of skilled personnel to maintain the computers unaffordable

All these issues must be addressed in a concerted manner with the overall aim of strengthening or building all the relevant infrastructures.
Awareness of science and technology

• widespread ignorance on the importance of scientific and technology knowledge by policy and decision makers and the public at large in Africa
• Many policy-makers largely unaware of the developments and advances in science and technology and the knowledge derived from these
• Important that all concerned are sufficiently aware of the developments and transformations that have occurred and are occurring in science and technology and of the important role that these play
• Enhanced awareness increases interest in the subject and leads to improved public support for government policies
• Also a prerequisite for a country’s ability to formulate and successfully implement science, technology and knowledge policies
Capacity development and institutional strengthening

Lack of capacity a major obstacle to:
• Successful development and application of science and technology
• Facilitating knowledge and information flows in Africa

To be undertaken as matter of priority:

The building of capacity and development of African institutions that create and disseminate knowledge

Scope of such institutions, where they exist, should be reviewed and brought up to date in the light of recent advances in science and technology and knowledge development and flow

Equally important is the development of human resources to ensure scientific and technological leadership
African knowledge networks in science and technology

- Have a beneficial role to play in the flow of science and technology information and knowledge in throughout Africa
- Activities of the network should be given a high profile and its goals articulated
- Membership drive should be increased
- A student chapter should be incorporated or enlarged
- A funding drive should be planned and executed
- The Network should also seek ways and initiate plans and strategies for cooperation with institutions in developed countries
Allocation of resources for scientific and technical research

- Closely related to the development and implementation of policies
- Strong need for governments to acquire and allocate adequate funds for education, research and development and related activities
- Institute and put in place required education reforms and to improve science education, in primary and secondary schools, universities and other institutions of higher learning
- Multinational corporations and national enterprises have the potential to make major contributions in this endeavour
International co-operation

International and multilateral bilateral and non-governmental organisations:

• Have provided resources for capacity building, institutional strengthening and building and training

• Will continue to play an even more a crucial role in these areas to supplement the contribution by individual countries.

There are many opportunities for private-public sector co-operation.

Regional and international cooperation should be further strengthened
Funding and investment

• there is pressing need for massive investment in the knowledge infrastructure and networks
• should be part of a policy framework and strategy
• Of critical importance: the need to create an environment that encourages both domestic and foreign investment
Improving job opportunities for science and engineering graduates

Many science and engineering graduates go without jobs because of:

• The lack of appreciation of their training and worth
• Poor economic performance and therefore reduced job opportunities
• Their places have been filled by less deserving compatriots

Consequently, invaluable resources are wasted and their potential unrealised

Initiate strategies for stimulating the economy

There should also be transparency in hiring of qualified graduates.
Development and implementation of policy

The presence of a working and effective policy framework for further development and application of science and technology knowledge.

Compelling need for each country to formulate and effectively implement such policies.

Should have clear objectives and goals as part of overall national development strategy.

Most policies fail because of poor implementation.

This area requires particular attention and should be viewed in the context of capacity building and institutional strengthening.
Conclusions

The critical role that science and technology play in meeting sustainable development objectives and goals is universally recognised.

Advances and innovations in science and technology and knowledge have had profound impacts to the society as a whole and to individual members of the society in diverse areas of human endeavour.

Knowledge is a critical input for change and for economic development

But in Africa there is an acute lack of appreciation of the importance of knowledge to national development.

Moreover, existing knowledge infrastructures networks in Africa are inadequate.
Conclusions cont

The suggested development, strengthening and general improvement of the knowledge infrastructures will help the countries apply knowledge to their economic and social development.

But first and foremost, each country must put in place working and effective policy framework for further development and application the knowledge.

Such a policy must embrace clear objectives and goals as part of overall national development strategy.
Thank you all