

## **Rapotours' Report for Pre-CHOGM Symposium on Science and Technology**

**Theme: The contribution of Science and Technology to Socio-economic transformation in Uganda.**

**Key: Q: Question, R: Response, C: Comment.**

### **Panel 1: The centrality of Science, Technology and Innovation to Societal and Economic Transformation**

#### **Key Issues raised:**

- Africa needs knowledge based economies, to build capacity for solving its own problems.
- The biggest challenge of the 21<sup>st</sup> century is the need to harness the good side of science and technology for peaceful purposes.
- There is need to involve leaders in science and technology transfer through a non-linear transformational model.
- Technological innovation is a process which involves different stages and expertise. The technology should be more efficient, effective and easy to transfer.
- No single institution can advance science, technology and innovation; therefore there is need for partnerships.
- Science and technology are a basic need not a luxury.

#### **Comments & questions**

- C:** There are differing challenges in the South and North in science and technology; therefore there is no uniform approach to technological transfer.
- C:** There is need to train more expertise in science and technology to match the population ratios. (This is still lacking)
- C:** Science and technology can only be embraced if it is affordable, accompanied by training and other forms of support; on top of respect for African culture.
- C:** Science, technology and innovation can only be practical if there is, infrastructural development in the education systems and higher institutions of learning which act as the knowledge base.
- C:** Much as technologies are being developed, there is need to multiply them and innovations brought down to beneficiaries (accessibility).
- C:** Government support is crucial in technological transfer.

## **Panel 2: Best practices in technology transfer for social transformations.**

### **Comments & questions**

**Q:** What is the way forward to link technology developers to industries?

**R:** For it to be practical knowledge (science, technology and innovation) should be pulled not pushed.

**Q:** What is the connection between company vision and skills?

**R:** Putting the developed technologies to use needs identification of skills to aid in achievement of the company vision. Skills in form of graduates would help the industries.

**Q:** What is the gender perspective in science and technology transfer?

**R:** There is need for affirmative action for women in research and technological development through specific support to women scientists.

**Q:** Are there any strategies to revisit the universities' curriculum to suit or allow for practical knowledge transfer?

**R:** The biggest challenge is the infrastructure required for training scientists. However there is need for creative curriculum and instruction which is appropriate to our society.

**C:** There is need to investigate why there is limited women participation in scientific research, and forge a way forward.

**C:** Researchers have all along kept their findings personal. There is need for linkage between the scientists and community, through a multi-disciplinary approach (science and humanities).

## **Panel 3: The Science and Technology Continuum**

### **Key issues raised:**

- There is need for increased investment in science and technology education for development. More infrastructural development for science and technology training through equipping science training laboratories.
- Technical education needs equal attention to meet the required ratio of technicians to other scientists.
- Innovations and or creativity in teaching applied science need to be embraced. Divert from theoretical to a more practical form of training.

- The training of science teachers, teacher preparation, and professional development needs to be addressed.
- There is need to embed science and technology in the millennium development goals.

### **Comments & questions**

**C:** There is need for curriculum development to make it handy with the market technological requirements by giving students the fundamentals of science. Critical thinking and innovation should be emphasised in training scientists.

**C:** Better teaching and infrastructure should be given priority. There is need to reduce the number of subjects done by pupils, so as to check relevancy.

**C:** Emphasise communication of science and technology through the simplest means possible e.g. Music. Drama, to motivate aspiring scientists in schools.

**C:** Devise means to retain the few young African Scientists (expertise) by motivating them.

**C:** Job prospects and status of scientists need to be addressed. Remuneration, facilitation and motivation for scientists and science teachers in particular needs to be revised.

**C:** There is need for collaboration between universities and technical colleges in capacity building. Development of technical colleges is crucial rather other than upgrading them into universities, because science, technology and innovation cannot be achieved without technical expertise.

**C:** The ratio of science and technology experts is important and needs to be taken into consideration.

**C:** Reported that the commonwealth scientists in Africa were playing their role with minimal support from governments. There is need for a strategy to see governments honour their pledges to support science and technology.

### **Panel 4: Institutional arrangements for science, technology and innovations in Africa**

#### **Comments & questions**

**Q:** Statistics show that only about 30% of the graduate scientists are retained in Africa, for example a case for Tanzania. What is the way forward?

**R:** There is need for institutional arrangements to train, retain and support scientists.

**Q:** How do we train and retain the best scientists in Africa, when we cannot support post-graduate training and research without donor support? Yet donors dictate priority areas for funding and thus control output?

- R:** Collaboration with institutions in developed countries will motivate young African scientists and build capacity to check brain drain.
- Q:** How can scientists publish in international journals and at the same time, put their findings in practice?
- R:** International publication is crucial and applicability will follow.
- C:** Science is society and every body is a scientist. There is need to create multi-disciplinarity in institutions.
- C:** There is limited funding allocated to scientific research. Policy implementers must take science, technology and innovation seriously.
- C:** Dissemination of scientific research findings is important. Scientists are keeping technological innovations but not helping those who need it. The future is for those who are organised.
- C:** The teaching of basic principles of science (biology/chemistry/physics and maths) has to be maintained but beefed up with innovative and multi-disciplinary courses.

**Panel 5: Communication of Science and Technology from Higher Educational Institutions: Engagements with Society through Community Outreach.**

**Comments & questions**

- C:** Indigenous knowledge needs to be documented.
- C:** Effective communication through information and communication technology is important to knowledge transfer.
- C:** There is need to train scientists who can live, relate and work with the local communities.
- C:** Collaboration with partners is key to achieve community based training.
- C:** Inquiry based science education (IBSE) will improve the teaching and learning of science.
- C:** There is need to lobby government, politicians and private sector to support science education and infrastructural development.
- C:** Research centres of excellence should be established with improved infrastructure to facilitate scientific research in institutions of higher learning.
- C:** Encourage scientists to do research and publish. Capacity building for rural based scientists is important.

## Questions and Comments

- Q: Why did the Makerere programme of attaching veterinary medicine students to communities end in three years?
- R: The programme was being supported by i@mak project which was phased out.
- Q: Are we ready to put content to the communities e.g. using ICT?
- R: Students are learners and transmitters of knowledge to the community. Therefore there is need to strengthen the bond between students and community. Graduates should feel the obligation to serve the community. The practicability of community based training is important.
- Q: How do you encourage scientists to publish in International Journals, yet they cannot access the information for reference purposes, since they do not subscribe to the journals.
- R: There is need for funding to subscribe to International Journals for scientists to access important literature and build ICT capacity institutionally and nationally to enable scientists access the world of resources/journals.
- C: Uganda National Council for Science and Technology (UNCST) has the obligation of managing property rights; it should give some light on how institutions can go about patenting.
- C: There is a general problem of lack of a National Strategic framework for science and technology in Uganda to use for lobbying for funds. A draft National strategic plan was submitted to Cabinet but has not been discussed.
- C: Institutions should value patent/paper but there is need to decide, which way to go because patenting is expensive.
- C: Centres of excellence are a practical idea that needs to be adopted by other institutions of higher learning. (It is a centralised, well equipped laboratory where research data can be analysed).
- C: The IBSE is not a new idea because it has worked in Nigeria; however it requires training of trainers in teaching methods.
- C: It is a pre-requisite to put research funds to proper use, by streamlining the channels of funding to ease facilitation.
- C: Mbarara University of Science and Technology was recognised for the component of Development Studies offered across programmes to equip students with aspects of community problems.

**Panel 6: Engagement between the Tertiary Education Sector and the private sector in Science and Technology Articulation of supply and Demand: Industry per services.**

**Questions and Comments**

- Q: How has private sector invested in research and development?
- R: Private sector is supporting research through Uganda Manufacturers Association (UMA) and Private Sector Foundation.
- Q: How can the academia be practically linked with private sector?
- R: There is need to create dialogue between the private sector on skills negotiation with training institutions. Institutions should publicise their skills and competencies to the private sector.
- C: Science and technology is a currency for development whereas tertiary education is a pre-requisite for development.
- C: Policy frameworks are important for technological transfer.
- C: Governments must invest in building capacity through training scientists, motivate and retain them.
- C: There is need to emphasise practical experience prior to enrolment for science programmes.
- C: Industrial training is core in the training of scientists and technical expertise, so as to get hands-on experience.