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RÉPUBLIQUE DU SÉNÉGAL

Un Peuple – Un But – Une Foi

AGENCE NATIONALE DE LA RECHERCHE SCIENTIFIQUE APPLIQUEE



**Special Symposium: Designing and
Sustaining Systems of Higher Education,
Research and Innovation for African
Development,
4 July, UNESCO, Paris**

INTRODUCTION

I would like to thank UNESCO for organizing this symposium; I find it extremely important and vital for the development of our continent; we are facing an alarming situation in the sector of research and higher education having mainly invested in basic education for many decades.

Now, we recognize that research and education must meet the demand of scientific quality, relevance for local development and reliability; linking research and knowledge production to a national innovation system, increase its relevance and impact.

The term 'innovation' is found in all kinds of discourse relating to policies, agriculture, ICTs, education, infrastructures and even to student and trade-union claims.

At first sight, one can obviously notice the need for a new approach, new ideas and perspectives, new policies, new paradigms meant to improve our economy, and beyond that, our society as a whole.

But beyond the words, what understanding do the different actors in society have of the term "innovation" and what implications in terms of actions and strategies derive from it?

Importance of Innovation: sectors where developed and emerging countries have significantly boosted their real (not virtual) economy, there is a tremendous effort and a great emphasis on knowledge and innovation through research and development.

This area of innovation through R-D is lagging to begin in Africa; nevertheless, we recognize that there is a real need for innovation and Africans scientists hope to bridge the gap between knowledge and know-how. We have no choice in face of the negative context where global crisis (food, energy, finances) imported to Africa is imposed to the unprepared countries. The solution remains in our capacity to find innovative ways to overcome these difficulties. We are really convinced that Africa can find the answer to this global crisis by transforming the elements of the crisis in opportunities for developing the continent. The important natural and human resources of Africa, the awareness and new orientation of donors

and political leaders to base strategic and socio-economic development plans on research and innovation, the need to rethink and develop new and innovative approach to partnership, are the main elements of this favorable environment which African countries can build on.

KNOWLEDGE AND INNOVATION IN AFRICA

Particularity of Africa's knowledge system: In Africa, we must be led to conceive and admit the concept of a contextualized "knowledge system", which combines modern and traditional knowledge, which are based on great cultural, ecological and religious diversity, and are scattered in all spheres of African society. It is also in Africa that we can easily conceive, recognize and accept that knowledge is not only formally generated in universities and research centers, but there are a multiplicity of knowledge-producing sites, mostly in rural areas and which have been accumulated over the centuries and transmitted by different routes from generation to generation. This knowledge-based system, both formal and informal, both empirical and intuitive, is a highly complex system.

So, we might have to naturally wonder about the reasons underlying the difficulty of absorption and appropriation by African societies of scientific and technological advances. In fact, considering the importance and complexity of natural knowledge-producing sites, and having not always sought to deconstruct them in order to better understand how they work, we are limited to formal education and training patterns, thus relegating to the background, or even ignoring, the other knowledge-producing sites. This is definitely a question that should be addressed.

Nevertheless, we all assume that knowledge production that proactively pursues interaction with local stakeholders is likely to make a better contribution to the empowerment of the poor and for that, linkages between informal knowledge-producing sites, university and other higher professional education, remains essential.

CONSTRAINTS AND NEW PERSPECTIVES

In Africa, since the advent of structural adjustment policies, it is quite common to notice the deepness of constraints and limitations to the research system leading to the weakness of research and higher education institutions, the lack of a well-structured organizational network of institutions and actors in the innovation chain, the inadequate and uncertain research-funding mechanisms, in a loose national economic system that has not been well-prepared to "absorb" innovation.

The innovative approach (i.e.: "innovation considered as a continuum, a value chain which, from the transformation of knowledge, produces goods and services, thereby increasing productivity, competitiveness, and ultimately welfare ") requires, not only relevant guidance regarding research subjects, a guidance based on the requirements of current socio-economic challenges, but also a multiplicity of social actors, stakeholders such as the public sector, NGOs, the private sector, social and civil organizations, etc

This approach necessitates the involvement of these actors in the drafting process of the Research and Innovation agenda, in its implementation, monitoring and evaluation of its impacts, in a "fighting-poverty-oriented approach" so as to be able to translate results in socio-economic activities.

So, the big issue is how to build a complex system in an inadequate environment, which requires the establishment of a coherent institutional and organizational network, which also requires the consideration of alternative mechanisms for partnerships and innovative financing mechanisms in a context of particularly acute food, energy, financial and economic crises?

It is these huge challenges that we have to pick up with great lucidity and determination, bearing in mind that this is a long-term strategy. But, not only do we have to think, but we have to think while acting, in other words we must "learn by doing."

Political will: Indeed, the government has recognized the need to support the research / innovation sector.

Building capacity in a new environment of research, by creation of research centers at regional level, together with strengthening linkages between research and the economy through scientific and technological Parks, raising public awareness in science and technology and to equip and train the users of the innovation especially in rural environment to allow them to absorb, integrate and even adapt the scientific and technological breakthroughs are likely to help reach our goals by overcoming constraints and greatly contribute to achieving the MDGs and reducing poverty.

STRATEGIES FOR SENEGAL

The agriculture and energetic sectors are identified as gateways to Research and Innovation; the main reasons are: (1) agriculture occupies 70% of the population and 20 to 25% of GDP (2) innovation can greatly impact positively agricultural GDP and as a matter of fact, any increase in the agricultural GDP benefits primarily to rural populations (3) Agriculture remains the area where Senegal has achieved scientific advances, mainly in varietal research for production and productivity improvement. The sectors of solar, wind and hydraulic energy have a great potential because of huge existing natural resources. Using innovative and relevant technologies is likely to ensure an adequate supply of renewable energy for the economic activities.

The implementation of a viable system of innovation based on these main elements:

- 1.** Raising Awareness on the importance of innovation in the process of development putting knowledge in the heart of political decision-making (decisions informed: science-based or evidence-based decisions), as was the case recently during invasions of locusts, floods and other situations. Political leaders must be prone to question, at any time, scientists for better decision-making, and the latter, in their turn, must be prepared to respond on the basis of reliable data. We also remain firmly convinced of the relevance of using reliable indicators and case study models and practical advice that will lead to the development of better socio-economic development policies.

2. Basing the management and organization of Research and Innovation on the identification and involvement of different stakeholders to facilitate the ownership of innovation. The National Agency we pilot was created to facilitate involvement in the process of the different stakeholders, i.e. Academies and research institutions, NGOs, training and extension institutions, producer associations, informal social and community-based networks, etc.. The involvement of many stakeholders in developing the agenda for innovation research requires shared responsibility for the monitoring and control of decisions at lower levels. This subsidiary principle guarantees ownership and sustainability of innovation at grassroots level. This grassroots approach makes innovation more accessible, more attractive, less removed from reality and therefore easier to absorb. The production of improved seeds is the first project that we have targeted to test the applicability of the concept of innovation system because of the multiplicity of actors and the importance of their interactions.
3. Recognition of the multiplicity of sites of knowledge production which are at different levels of evolution prompts us to promote and give added value to these non formal sites. Integrating the "local knowledge" dimension: For years, development policies in Africa, especially scientific policies, have ignored the knowledge and know-how dimension in the development of their agendas. We need to value our traditional knowledge, our genetic resources, protect our therapeutic and spiritual knowledge, and ultimately our cultural values, so that they can become genuine factors of socio-economic development. This is the case of hospitals that use traditional methods of treatment for a great portion of the rural population. We need to confront traditional knowledge with modern knowledge based on a classical evaluation framework in order to validate this knowledge and give them an added value through scientific recognition.

FUNDING

The government of Senegal has decided to allow internal funds, to build an African regional center of excellence and a science and technology Park. It is important to note that the focus has been placed on strategic management of human and technical resources oriented to ensure socio-economic development through innovation.

The creation of a high level infrastructural research environment is fundamental; it is recognized that where there is an improvement of the national research environment and infrastructure, the private sector and other donors are more inclined to invest in research and development. Therefore, to convince innovators and the private sector to engage in the process of innovation, we must find new forms of investment.

To feed the innovation system, given the novelty of the subject, it will be necessary to rely on diverse financial mechanisms, especially "soft" ones, such as "grant funding" (for instance small start-up grants), tax incentives, public-private partnership contracts, etc. ..

In this regard, we have initiated discussions on a contract model for public sector-private sector partnership intended to promote innovation that defines criteria for:

1. Risk sharing, since the business success of innovation is very at high risk ;
2. The market-led orientation and selection of highly competitive and not only technologically interesting products ;
3. Supporting innovation project initiators in their project implementation ;
4. Regular performance monitoring and evaluation.

This means that we need to define program priorities, project selection procedures and criteria in a transparent approach with the participation of a team of evaluators from different backgrounds.

CONCLUSION

This program aims to lay the foundations of a new dynamic in research and innovation, based on existing research institutions, but also creating new knowledge-generating and knowledge-transferring spaces with added value such as the African Center for Research and Applications (CARA) and the Science and Technology Park (PST).

This is a work based on the long term, a work consisting in building entrepreneurial capacity in science and technology coupled with smart funding systems that emphasize creativity and risk rather than the comfort of bureaucracy. This calls for the creation of a science and technology alliance between the North and the South, with a view to promoting a staunch and sustainable partnership.

We hope that new forms of partnership between Northern countries and Africa will emerge from this meeting, a partnership based on a shared vision and a shared approach to innovation as the driving force of research in Africa, with particular emphasis placed on the promotion of entrepreneurship driven and fueled by creativity.