

1. Identifying the challenges.

- ✓ Inadequate financial support for science, weak universities, few research centers, isolated scientific communities, and lack of competence in scientific and technological teaching;
- ✓ Disparity in investments, productions and human resources in science and technology. There is a narrow correlation between research capacity and economic power. As exist enormous differences among the state budgets, also exist differences among the sums dedicated to research. While developed countries invest between 2.0 % and 2.5 % of their GDP in researches, development and adjustment, adaptation and application of science and technology, the developing countries invest only between 0.3 % and 0.5 %. As a lot of research has been derived from the development of INTERNET, it has made worse this problem, because it is a fact that while richer is a country, denser it's its NET. That's what explains why more than 95.0 % of INTERNET's users come from these countries;
- ✓ In the developed countries 0.2 % of the population takes part in science and technology, while in the developing countries the figure is about 0.05 %. In consequence, the total production of scientific publications and patents coming from developing countries is below 10.0 % of the total world production;
- ✓ Brain drain undermines even more the precarious situation of developing countries. It has always represented a type of assistance that developing countries have lent to the developed ones, due to the considerable investments in education and training that emigrants have received in their countries of origin before leaving abroad. The permanent migration of highly qualified personal have a very hard impact on the development of developing countries and it has contributed to increase more and more the existent gap;
- ✓ At the moment, the private sector is responsible for two thirds parts from all the new researches in the world. The barriers imposed by intellectual property are blocking the access of developing countries to scientific data and information, for them to access. So researchers from developing countries have little or no access to published research literature due to the high cost of journal subscriptions and inadequate and expensive distribution mechanisms;
- ✓ Although ICT tools can decrease the cost of disseminating scientific data and information they require that people have a higher level of information literacy. Illiterate persons will never understand the use of ICT. Consequently, the access to education is a fundamental right, at the same time that an instrument to combat illiteracy, marginalization, poverty and exclusion;
- ✓ Most of the world population doesn't have access to any ICT, either radio, telephone or INTERNET. However, this traditional infrastructure still constitutes an essential element for accessing and disseminating scientific data and information..

2. Recommendations.

It is difficult to indicate general recommendations for developing countries because the situations in each of them vary considerably, in dependence of their sizes, populations, current conditions of development, historical records, economic situations, political will and their leaders' vision, as well as other factors. Nevertheless, exists a group of commons actions which could be recommended.

- ✓ In any country, the domain of science and technology should be guided by its state-of-the-art groups of Scientifics and technicians. Those scientists and technicians should: a) help in the adaptation of ICT technologies to the local conditions, b) work to incorporate new science to education, c) participate next to the government. They should also participate in the creation of an effective mechanism to foment scientific exchanges, cooperation and shared development among the countries of the South, by means of South-south cooperation;
- ✓ The improvement of levels of life requires of the scientific and technological development that in turn demands the elevation of the general cultural level of developing countries. This can be achieved by the application of programs of massive education and the setting in march of campaigns to eradicate illiteracy;
- ✓ The link between development and teaching of science with the technological innovation should be reinforced. Therefore, where it is possible, there should be organized research institutes and scientific and technological centers: a considerable part of their activity should be dedicated to apply the science to find solutions to local problems, for example, in the attention of health, agriculture and industry, and to promote close relationships among universities, research institutes and industry;
- ✓ Creation of several regional centers of international level for scientific training of neighboring countries in diverse spheres of science and technology;
- ✓ Improvement of the universities and technological schools, with modern programs and well trained and active professors. These efforts should reach the whole country, that is to say, countries that have universities of quality in the big cities should use them to improve or to create other universities or abilities in less developed regions of their countries;
- ✓ Strengthening of existent networks of scientific policymakers (like TWAS and TWONSO), with outstanding academics and scientific leaders who work in developing countries;
- ✓ Increase financing for research projects, development of South-south exchange of scientists and support to scientific institutions;
- ✓ The creation of scientific advice organizations at the regional level in the South would increase the capacity of negotiating with institutions from the North, both, for obtaining infrastructure, and for the free availability of scientific and technical publications via INTERNET;
- ✓ The different Open Access initiatives, through which scientific data and information is made openly and freely available digitally on line, eliminate the economical barriers for accessing and disseminating information. So,

Governments and organizations should advocate that research output should be archived in open access archives as soon as possible, and in any case, not later than six months after the publisher's date of final publication. An awareness raising exercise followed by regional technical workshops to train key individuals in creating and maintaining open access archives should be carried out as well.