



Joint G8 science academies' statement on Innovation for Development

The role of Science, Technology and Innovation for Development in Africa and other developing regions

Local Capacity

A substantial fraction of the economic growth of the 20th century derived from advances in science and technology and their application in health, agriculture, information and communication technologies, energy, and many other sectors. The ability of a country to benefit from these advances and to secure a decent standard of living for its people depends on the capacity of its people and its institutions to innovate, i.e. to master the adoption, adaptation, and advancement of existing technologies, as well as the creation of new ones. Innovation refers to the full range of changes, large and small, used to achieve desired outcomes. Innovation often results from basic research that can lead to groundbreaking discoveries and inventions.

In parallel with efforts to promote economic growth and wealth creation, developing countries face an increasing number and range of major challenges, such as emerging or re-emerging diseases, lack of access to safe drinking water and other environmental challenges, and in many cases an unprecedented number of young people who need education, training and opportunities.

Innovation will be essential in meeting all of these goals and challenges.

Human Resource Development

The knowledge, skills, and motivations of people are the ultimate basis for social and economic development. The breadth of the challenges facing developing countries makes it imperative for them to simultaneously address all of the major aspects of human resource development: moving toward universal and effective primary and secondary education; enhancing advanced education and training, especially in areas of national importance, and connecting the content and experience in the educational and training systems with workforce needs in both the private and public sectors.

Effective teachers, trained beyond secondary level are critical for high quality primary and secondary education. Innovation is essential for the entire human resource development sector: and the need is for people who can continue learning throughout their lives. Primary education can start to develop those skills that the workforce needs to be innovative in all sectors, including the informal sector that is often a major part of developing countries' economies. Innovative approaches are critical to create jobs, rather than just fill jobs that may currently exist.

Partnerships can be especially valuable as developing countries struggle to meet the needs for education, and for educators. In particular, networks of educational institutions in Africa should work together to combine training capacities and information resources, with support from G8 countries and in cooperation with universities in G8 countries. These partnerships could produce increasing numbers of the desperately needed high-quality, up-to-date faculty for African universities and teachers for the elementary and secondary school systems.

Recommendation: G8 and other countries should increase support, both direct, and via partnerships with their educational institutions, for education and training programs in Africa and other developing regions, including:

- Innovative primary and secondary science education programs such as inquiry-based education, to improve effectiveness;
- Regional networks of research and training institutions in developing countries, focusing on priority fields of those countries;
- Innovative modes of support for faculty and programs of universities of developing countries;
- Training in entrepreneurial skills and internships relevant to the public and private sectors;
- New learning technologies adapted to the specific needs of developing countries, such as e-learning in Africa;
- Merit-based decision making, such as peer review, and competitive approaches for education, training, and technical programs;
- New strategies to minimize the negative impacts of brain drain.

National Development Strategies, National Innovation Systems and Science and Technology in Africa and other developing regions

National development strategies, reflecting local realities often operate in a changing and challenging global context, and thus must themselves be innovative and adaptive, rather than static. Such national strategies need to be broadly understood and supported by a wide range of individuals and institutions.

National strategies need to develop the right balance between programs driven by government planning for public needs and the dynamic decision-making of the private sector. A successful innovation culture requires a continual process of consultation between public and private sectors to enable them to work together effectively. This is as true for modern service, manufacturing and mining sectors as it is for smallholder agriculture and microenterprise.

National innovation systems need to implement multi-pronged strategies that include education and training, research, development and innovation, as well as supportive government programs and infrastructure. Governments also need to appreciate the fundamental value of basic science in attaining the innovation goals.

Recommendation: G8 and other countries should

- Act on the principle of basing cooperative and support programs on national development and innovation strategies developed and adopted by developing countries;
- Align their own cooperative and development assistance programs to build capacities of individuals and institutions in developing countries. Of particular importance is building local capacity for making and implementing informed decisions, and for managing the diverse contributions of official and non-governmental international assistance;
- Support the strengthening of universities and establishing centres of excellence in basic and applied science, engineering, and in areas of high priority for national innovation systems of developing countries;
- Assist developing countries in improving access to knowledge resources via ICT to empower citizens to accelerate progress in meeting the goals and objectives of national innovation strategies.

Commercialization of Scientific Discoveries and Inventions to Build Prosperity

Science is a fertile source of discoveries and inventions for commercial innovation. Extensive translational activities are often needed before the benefits of science can be reaped by societies. In order to strengthen commercialization, many

countries have introduced legislation over the last two decades which has given universities and publicly financed research organizations the right and the obligation to manage intellectual property, often via technology transfer offices. Universities and research institutions also support commercialization by establishing entrepreneurship centres and providing seed funds for financing early-stage startups. Incubators and research parks are commonly found in developed countries, and developing countries are increasingly using these concepts, or experimenting with them.

Developing countries face significant challenges in harnessing the fruits of new knowledge and technologies. Transferring innovations often needs extensive adaptation. Foreign direct investment can serve as a powerful contributor to building national scientific and commercial capabilities. Commercialization models built on entrepreneurial activity are valuable in getting multinational firms to locate in a developing country. Participation in global networks of entrepreneurship centres, and access to venture capital are key elements that can empower developing countries to build their own innovative capacities.

Recommendation: G8 and other countries should

- Ensure that policies of intellectual property protection and commercialization reflect the needs of the developing countries;
- Help developing countries define and develop the regulatory and incentive systems to promote innovation;
- Encourage the development of collaboration between research institutions and industries for the promotion of technology and knowledge transfer;
- Support the dissemination of best-practice models. Experimentation will be required to find solutions that best fit local situations.



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