

Science in the rising nations

It is recognized that 80% of the world's people living in three-fifths of the globe possess just 20% of the world's wealth and that the poorest fifth of the world's nations hold only 1.4% of the world's riches. It is no wonder that hardly 3% of the internet hosts are in the developing countries. The developing countries are also the rising nations of the next millennium, since things can only improve in these countries. Let us remember that during the 30-year-period between 1950 and 1980, the developing countries bettered the progress made by the advanced countries in the north during the 80 years of the 19th century between 1820 and 1900. It is therefore entirely possible that in the next 30 years, say in the period 2000–2030, a good proportion of the developing countries will catch up with the advances made in the developed countries during the 20th century. In so doing, they may indeed become significant players in the world of science.

It is not as if science is new to all the developing countries. The contributions of India, China and Egypt to knowledge at the very beginnings of science are acknowledged. China, India and Brazil have emerged as important members of the developing community, because of the progress made by them in science and technology.

While scientific innovation is concerned with the future, we cannot ignore from which the future evolves. One cannot, however, allow the past to dictate the future. While making use of some of the sound traditions, the developing countries have to forge a different future. Fortunately, differences in human intelligence do not parallel the differences in the science and technology base. The developing countries have to find their role in the major revolutions in science and technology of this century such as the gene revolution, materials revolution, information technology and communications revolution and ecotechnology revolution. In addition, they have to improve the infrastructure in the various crucial sectors, an important ingredient of the infrastructure being the educational base. Capacity building in science at all levels is of paramount importance in a majority of these countries, not only to provide the manpower, but also the self-esteem that is essential to enable them to become competitive in the present-day scenario. Information technology provides a great opportunity for capacity building and to bring in social integration that seems necessary in many of the countries. Being relatively inexpensive, IT has to be exploited for societal purposes with haste if these nations

have to make significant progress in science and technology. It is also necessary that in these efforts, there is greater international cooperation and collaboration.

The general trend in recent years appears to be one where there is diminishing international aid for capacity building and promotion of excellence in science in the developing countries. While both north–south and south–south cooperation in science and technology are essential to make real progress, south–south cooperation involving the least developed countries and countries such as China, India and Brazil should be able to satisfy many of the needs. Fortunately, even the least developing countries realize today that they have to gain equality in terms of knowledge. They have to be provided all help possible without delay. This assumes greater urgency when we recognize that the gap in science and technology between the advanced countries and the developing countries is ever increasing.

I have every hope that if things go well, some of the least developed countries may indeed attain a much improved status in the next 30 years. There can be major achievements in many of the developing countries in crucial areas such as availability of safe drinking water, removal of illiteracy and eradication of malaria and other diseases. I give below achievable targets in the next few years.

Preparation of S&T-based national development plan	2003
Investment in S&T (1–2% of GNP)	2010
Universal primary education and scientific literacy	2010
Safe drinking water for all	2005
Food security and eradication of malnutrition	2010
Eradication of malaria, polio and other diseases	2010
Management of biodiversity	2010
Improvement of science departments in the education sector to bring them up to acceptable standards	2010

Amongst the above, providing safe drinking water alone will bring about a sea change by eliminating most of the common illnesses and enable the citizens to take up worthwhile tasks.

I realize that all the developing countries may not become equally developed within a specific time-frame. There will still be differences, but taken as a whole there will be more investment in science and also a greater utilization of science in the third world, with

most of the countries showing upward mobility. It is likely that there will be a few science and technology giants in the developing world, the likely candidates being China and India in Asia and Brazil in Latin America. Countries such as Chile, Mexico and Nigeria would be leaders in science. There will still be brain drain and it is possible that there will be even greater migration of science and technology personnel from the developing to the developed countries. Teachers and nurses from the developing world may probably provide the workforce in many of the advanced countries in the years to come. In view of this factor, it would be necessary for some of the developing countries to examine their manpower needs and programmes for manpower training. We may, however, reach a steady-state situation by the middle of the century when the developing countries are

able to manage their problems better because of their internal strengths.

I wish I could end my essay here. It is possible some of the least developed countries, particularly in Africa, may remain backward economically and scientifically even after 2030 because of inadequate initiative and other factors. We should be able to prevent such a situation through international help and understanding. If we accept that all of us on the globe are entitled to the power of knowledge and that the pursuit of happiness through knowledge, is a birthright of humankind, it becomes our moral duty to ensure the transformation of the less fortunate.

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