BIPP | **P**olicy **B**rief 31/2016

# Science and Technology for Human Development: State-Citizen Synergy

By

*Shahid Najam*
*Zain Azeem*

**The Shahid Javed Burki**
**Institute of Public Policy at NetSol**

# Science and Technology for Human Development: State-Citizen Synergy

by

Shahid Najam and Zain Azeem[1]

Globalization and advancements in science and technology have brought about a paradigm shift in the intellectual and academic pursuits as well as the thinking of development practitioners that good governance and economic reforms, though necessary, are not sufficient on their own to emancipate the humanity from the enormity of the challenges of hunger, ignorance, disease and environmental degradation. It is absolutely essential that science and technology becomes an integral part of the national sustainable development strategy for the well being of the citizens as well as country's integration in the competitive global market. There is a plethora of evidence to testify to the achievements and gains in the areas of agriculture, manufacturing, communication, service delivery, health etc., with the application of scientific knowledge and technology. Indeed, the destiny of the poor and deprived segment in the developing world hinges, to a great extent, on the ability of these countries to leverage science and technology and building national S&T capability for sustainable human development. The major strategic challenge, therefore, for the developing countries is how to harness science and technology to accelerate the pace of human development; how human development, in turn, can foster a pervasive culture in the society to inextricably link the knowledge and technology generating centers with agriculture, industry and development.

It also needs to be recognized that there is a wide divide between the developed and developing countries in terms of research and development effort and generation of technology, knowledge and innovation. A large majority of the developing countries are neither technology and invention developers nor have the capacity to horizontally diffuse and disseminate these within their societies. While the average citizen of wealthy

[1] Shahid Najam is the Vice Chairman of the Shahid Javed Burki Institute of Public Policy at NetSol. He was assisted by Zain Azeem, an Intern, in writing this paper.

economies enjoys the products of the latest scientific advancements and sees his life improve as a result everyday through, for example, ever cleaner and more available drinking water made possible by costly purification technology, more than 1 billion poor toiling in developing countries struggle to access any adequately potable water at all[2] [3] not to speak of more than 2.6 billion people who lack access to adequate sanitation[4]. The superconductor technology is being developed and deployed in the developed world so that high-speed trains may become yet faster to save time, energy and resources and at the same time facilitating commuters and boosting economic activity. Most of the poor countries are still wrestling with the problems to develop basic infrastructure to connect rural areas. Government schools in more developed countries distribute laptops to their students free of cost, while millions of children around the world remain unable to attend school at all[5] [6].

Much in the same way as science has improved the lives of citizens of wealthier countries, it has immense potential to do so in developing countries. However, undirected development and utilization of science and technology for its own sake does not necessarily benefit human development; it may very well exacerbate many developmental issues by widening the gap between the haves and have-nots within and between societies. Tackling these issues continues to be a daunting task in both political and logistical terms.

The developing countries cannot simply ape developed countries in their research, adoption, and deployment of science and technology. The anthropological, cultural and the local context specific factors have to be fully factored in designing the scientific and technological interventions. They need to create their own development dynamic and forge their own paths towards development, particularly, in the areas of human capital formation (education and skills development), service delivery, ICT

[2]World Bank. "A Water Sector Assessment Report on the Countries of the Cooperation Council of the Arab States of the Gulf." (2005).

[3]Watkins, Kevin. "Human Development Report 2006-Beyond scarcity: Power, poverty and the global water crisis." *UNDP Human Development Reports (2006)* (2006).

[4] ibid

[5]Hu, Winnie. "Seeing no progress, some schools drop laptops." *New York Times* 4 (2007): A1.

[6]UNESCO, UIS. "Out-of-school children: new data reveal persistent challenges." *Retrieved June* 30 (2011): 2011.

infrastructure, entrepreneurship and trade and investment through the efficient use of science and technology. As a fundamental imperative of this pathway, they must intimately understand the priority needs of their citizens around provision of basic human needs (food, shelter, clothing, health and other necessary services), development of basic human capabilities (education, knowledge and skills) and creation of conducive environment (political, social and economic stability) to enable people exercise their choices for achieving higher welfare status. The design and deployment of citizens' responsive scientific and technological solutions invariably lead to equitable and sustainable development.

The centrality of state-citizen synergy in harnessing S&T for human development thus cannot be over emphasized. Any attempt in the scientific progress to relegate citizens to periphery is tantamount to denying them the right to development. Scientific progress misaligned with public needs leads to the squander of critically limited and scarce public funds. For example, in pursuing its nuclear power program, India mobilized thousands of skilled technicians and hundreds of millions of dollars. The product of this investment was power production that, while helpful, did not resolve India's power crisis. Further advancement in the nuclear technology led to the development of India's nuclear weapons program. Pakistan, per force and facing the existential threat, had no choice but to pursue the same to maintain the geo-strategic balance of power. This has resulted in the recurrent allocation of large chunks of budgetary resources to the nuclear programs to the neglect of basic human needs and achievement of the Millennium Development Goals in these countries [7].

One may hazard a guess that this was not the desired outcome of India's decision to develop nuclear technology. The aspiration of political power centers, scientists, and much of the public at large to advance their country's development and standing in the world in one large stride through the pursuit of a monumental scientific achievement is understandable, but since the spirit behind this aspiration was not respected, it pushed India into the unbridled pursuit of developing nuclear arsenal and weapons of mass

[7]Goldemberg, José. "What Is the Role of Science in Developing Countries?" *Science Magazine* 20 Feb. 1998

destruction with Pakistan, following the suite, to the great detriment of the overall human welfare gains.

In our view, this failure of publicly funded science, on the one hand, stems from a disconnect between the myopic political imperatives of the ruling decision makers and the needs and capabilities of the society (which ought to be the ultimate beneficiary of the scientific products and knowledge) and on the other, a disconnect between the production side of science (scientists themselves) and the demand side (general public) [8] [9]. The key determinant for allocating public funds to undertake scientific endeavors is thus contingent upon both how robust are the mechanisms to aggregate and articulate the preferences of a vibrant and vocal civil society and how much responsive, responsible and efficacious government mechanisms are to integrate those needs and preferences in setting the scientific research agenda. In the process, the scientific community has to play a key role in mediating and reconciling the state-society concordance with a view to promoting outcome based funding model for research and scientific endeavors.

[8]Sarewitz, Daniel, and Roger A. Pielke. "The neglected heart of science policy: reconciling supply of and demand for science." *environmental science & policy* 10.1 (2007): 5-16.
[9] U.S. Congress, Office of Technology Assessment, "Perspectives on the Role of Science and Technology in Sustainable Development." *U.S. Government Printing Office* (1994).