

# 14 U.S. Science and Technology Policies from the Vantage Point of the Developing World

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## Introduction

Is science and technology supposed to benefit humanity? A “developing country” mind inquires. If so, it is hard to imagine how billions of people can be invisible. But in a science and technology policy sense, they are! The international system led by the United States has failed to meet the scientific and technological needs of the world’s poor. The United States promotes a high-tech world, yet the promise of technology remains largely unfulfilled in the developing world.

From the vantage point of the developing world, the United States is completely detached from their realities. The poor of the developing world live in different climate zones, have different modes of agricultural production, face different health conditions, and have different lifestyles. The United States is materials-intensive, promotes mass consumption, is powered by fossil fuels, and is geared toward economic growth with little regard for human welfare. U.S. science and technology emphasizes defense (i.e. military) spending, industrialized world health and agricultural issues, basic research in the natural

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sciences, space exploration, and conventional energy. A developing country view notes that the United States is not just about “missiles and medicine.” It is, simply, about business as usual. (But this model has been challenged at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, and this challenge will be renewed with vigor at the 2002 World Summit on Sustainable Development in Johannesburg.)

I will touch on only a few sectors as examples of concerns in the developing world: health, agriculture, and energy.

## Health

The U.S. health care system is driven by profit-makers. A developing world perspective notes that the United States subordinates public health for private profit. Because there is no market incentive, the health needs of the poor are overlooked, and the world’s poor are mostly in developing countries.

For example, between 1975 and 1997 approximately 1,200 medicines were commercialized. A mere 13 of these were designed to treat tropical diseases. Many infectious diseases (such as malaria, tuberculosis, and HIV/AIDS) are public health threats in developing countries, yet eliminating these diseases is possible. For example, malaria and HIV/AIDS are serious burdens in many developing countries, especially those of sub-Saharan Africa. Many in the developing world feel that countries such as the United States are controlling these epidemics by producing drugs that are too expensive for them to use, whereas the cheaper option of producing vaccines is underfunded. Vaccine research that is being funded focuses on viral strains that are prevalent in the United States and not in Asia or Africa. Again, it is all about the bottom line.

The United State’s stance is, of course, preoccupied with the diseases of affluence (such as cancer, diabetes, and heart disease) that have risen globally over the last decade, but exponentially in the United States. Ironically, from a developing country perspective, this increase may be due to “successful development.” Because of increased life expectancies, diseases associated with old age have become common. But from the vantage point of developing countries,

this increase can also be attributed to bad eating habits, inactivity, and smoking.

The developing world would like to see the United States step up to the plate and take leadership in bridging the gulf between human needs, scientific inquiry, and market returns.

### Agriculture

In agriculture, the greatest concern is with the advancements in biotechnology. Biotechnology has a great role to play in enhancing agricultural productivity in developing countries. Hundreds of tropical foods can be enhanced by directed biotechnology research. But biotechnology's current emphasis bears little relevance to the needs of poor farmers and the world's hungry. Food producers in developing countries are not producing at their potential. This is not because they do not have the technology of miracle seeds that come replete with insecticides and herbicides. They are not producing at their potential because they have been forced into marginal environments.

Most hungry people live in areas with food surpluses and not deficits. The concern is not producing more food but distributing it more equitably. But recent work in biotechnology is moving in the opposite direction. In fact, a great deal of biotechnology investment has gone into producing traits that are compatible with large-scale mechanized farms and not small-scale family farms. Many in the developing world feel that genetically modified organisms (GMO) are, in reality, a threat to equitable distribution. People from developing countries worry that transnational American companies are seeking to discover transgenic manipulations for the sole purpose of enhancing their own patents, and, therefore, profits. This strategy favors large-scale farms.

Furthermore, biotechnology is controlled by a system of proprietary obstacles that are difficult to penetrate. The area has generated windfall gains for the United States and its transnational companies, but it has left the poor behind. The fear is that biotechnology in general, genomics, and GMOs in particular are being steered in a direction that shall ultimately increase control by putting food production in the hands of a few.

The United States must exercise greater leadership on the issue of patent rights before these rights allow a handful of transnational companies to own the genetic codes of foods that we all depend on. This will require new science and technology policies, a new framework that fosters collaboration with tropical research centers, and new market incentives for the large private firms. The United States, through the World Intellectual Property Organization and the United States Patent and Trademark Office, is already working with countries such as Albania, Kenya, and Vietnam to help improve intellectual property regimes. These efforts need to be continued and strengthened.

From the perspective of the developing world, the agricultural sector in the United States provides a cogent example of the complexity of the research and development (R&D) system. Are government and industry any different? A “developing country” mind inquires. What is the challenge of merging private and public science activities? Are they already merged? Is this truly one system?

## Energy

People from the developing world are alarmed that U.S. energy policy is reverting to conventional (and old) types of energy. This is contradictory to the developing world’s agenda of promoting non-conventional energy initiatives, especially in response to the crisis of global warming. The issue of global warming (which is caused by the increase of atmospheric carbon and other gases) is a great concern for the developing world. This concern is exacerbated by the U.S. reluctance to support the Kyoto Protocol. Why should developing countries pay to address global warming if the United States does not? The developing world will never give up this position. The United States is responsible for almost 25 percent of global carbon output. It has the technology, if not the will, to curb emissions. Its reluctance to commit to the Kyoto Protocol does not sit well with developing countries.

In addition to the economic costs, global warming extracts a high human cost. Global warming may be contributing to the increased severity of tropical climates. Weather events that happened once

every hundred years are now happening much more frequently. From a developing country perspective, these damages have been imposed on innocent people. The debate will remain stalled until the United States and other rich industrialized countries make a concerted effort to curb their emissions.

### Conclusion

A developing country perspective observes that if science is supposed to benefit humanity, then research questions must address the problems of the developing world. Science and technology must show a greater responsiveness to the needs of all the world's citizens. Successful applications of science and technology to the problems of developing countries must be seen in terms of opportunities and not obstacles. It is often said that the developing country infrastructure is not suited to assimilate new technologies from the United States and other industrialized countries. Developing countries should not be viewed as problems but as resources that must fulfill their potential, along with other countries, for the betterment of humanity. Both the United States and developing countries have much to learn, providing opportunities for R&D questions that are still unexplored. Future developmental prospects for the United States and the developing world will depend on their ability to work together for common goals.

Many United Nations (UN) agencies have tried to bridge the gap between the science in advanced countries and that in the developing world. But the United States' less than cordial relationship with the UN has been disappointing to the developing world. With greater responsiveness, the United States and developing countries must learn how to cooperate. (We have already seen many developing country scientists and engineers working in the United States and making significant contributions to science and engineering.)

All countries must together learn how to mobilize science and technology for the problems of developing countries. They must together work out a more fair system of intellectual property rights. The R&D system is geared overwhelmingly toward the problems of

developed countries. The United States must take the leadership role in making the poor of the developing world visible and it must mobilize science and technology to address their crises.