

FEEDING A WORLD OF SIX BILLION

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There are now six billion of us on the planet for the first time in history. Although the six billionth child was symbolically born in Sarajevo according to the United Nations (UN), it was most likely born in an impoverished country in Asia or Africa, will be malnourished, and may not live even to the age of five.

The world's population was about 300 million at the time of Christ, and it took 1,800 years for it to reach one billion. However, it needed only 12 years for the population to expand from five billion to touch the six billion figure of today. A quarter of a million new people are being added every day and we will have nearly nine billion people on this fragile planet by 2050, experts tell us.

How can we feed this ever-increasing population? One billion people go to bed daily on an empty stomach, and there are 40,000 hunger-related deaths every day. This “silent holocaust” is “unconscionable”, pleads Ismail Serageldin of the World Bank. Mahatma Gandhi, the apostle of peace, called hunger the greatest of all violence.

There has been a massive increase in food production in the past few decades – not only in the world's granaries like the United States (U.S.), Canada or Australia, but also in China and India. This increase has been spurred by science-based crop improvement programs, along with improved access to irrigation, fertilizers, pesticides, better credit; and also as a result of better market policies. International agricultural centers, such as the International Rice Research Institute (IRRI) in the Philippines and the International Center for the Improvement of Maize and Wheat (CIMMYT) in Mexico have helped increase grain yield several fold, especially in the poor countries. Scientists have made our crops more productive, more resistant to pests and helped them to grow faster and with enhanced nutritional benefits.

But we need to do more. Within the next two generations, the world will need twice as much food as produced today, says Anatole Krattiger of the International Service for the Acquisition of Agri-biotech Applications (ISAAA) at Cornell University. How can we do this when land and water resources are decreasing, and while, at the same time, reducing the use of chemicals on the farm? How can we ensure environmental sustainability and yet produce more food to put an end to the chronic under-nutrition rampant in the developing world? How can we improve the quality of life in rural areas of the world that are dependent on farming and, thus, help turn the tide against massive migration to urban areas?

The answer clearly lies in the continued development of farming technology and its meaningful integration with current agricultural practices in parallel with enabling policies. Traditional technologies are reaching their limits and we need to examine the vast potential of new technologies, such as genetic improvement

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of crop plants, with an open mind. Gene technologies have many solutions to offer in addressing food security issues across the world. While there are some real and perceived concerns about the safety of these techniques, their benefits far outweigh some of the risks.

The new genetic enhancement tools allow scientists to redesign crop plants to be more productive, more sturdy, tolerant to diseases and pests, and with improved nutritional attributes such as enriched protein quality and enhanced vitamins. Much of the quality arable land around the world is disappearing under population pressures. Future crops will be increasingly grown on marginal lands with problems like salinity, water stress and acidity. Biotechnology can alter crops so that they can be grown on such soils. Improved shelf life of fruits and vegetables through delayed ripening can help eliminate wastage that is especially rampant in the third world where refrigerated storage and transportation facilities are minimal.

Farming can be made more profitable with the production of novel renewable resource products such as biodegradable plastics, industrial enzymes and alcohol in an environmentally friendly manner. The production of edible vaccines and other pharmaceutical products in crops would also have important implications for enhancing the quality of life in impoverished countries.

Food products derived by the new gene technologies are as safe, if not safer than conventional products, and are ensured to be substantially equivalent to existing products before their commercial release. As David Aaron, of the U.S. Commerce Department told the Senate Finance Committee panel last week, "Thirteen years of U.S. experience with biotech products have produced no evidence of food safety risks beyond those of their natural counterparts." There has been "not one rash, not one cough, not one sore throat, not one headache attributable to biotech products." (Palmer, 1999).

Genetically modified food is subjected to hundreds of tests for their nutritional value, food safety, toxicity, and allergenicity. In contrast, the traditional varieties of crops are never subjected to any such tests. Likewise, conventional crops have not been tested for their environmental impact. These crop varieties are often developed through crosses with wild species involving the transfer of hundreds of unknown genes. In contrast, genetic improvement involves precise transfer of one or two genes with clearly known function and food value and whose products are already in our diet. There are far greater differences between any two varieties of a corn plant than between genetically improved corn and its counterpart from which it was derived.

If the current standards of food safety or environmental impact required for genetically improved crops were to have been historically enforced for the entry of new crops in the United States, American farmers would be growing blueberries, Jerusalem artichoke and sunflower - the only crops native to this country.

Critics of biotechnology argue that we should not be playing God or meddling with nature. Human beings have always altered nature since the dawn of civilization by inventing agriculture, domesticating animals, preventing the spread of infectious diseases, and by providing clean water. As the Church of England recently concluded, "Human discovery and invention can be thought of as resulting from the exercise of God-given powers of mind and reason" and "in this respect, genetic engineering does not seem very different from other forms of scientific advance." (Church of England, 1999).

The farm sector, like any other sector, needs continuous technological infusion. Fears that world agriculture will be controlled by private companies ignore the reality that corporations already provide inputs for farming, such as improved seeds, fertilizers, and pesticides. Agriculture, as with any other sector, stands to benefit from the competitive enterprise and the innovation that is inherent in the free market system. It would be hypocritical to deny this opportunity and choice to farmers. Research on staple crops that feed the developing countries, such as rice, cassava or sweet potato will still be the domain of public sector research. It is therefore critical to strengthen these institutions.

Critics of biotechnology invoke the trite argument that the shortage of food is due to unaffordability and its unequal distribution. This criticism completely undermines the need for increased food production locally across the world. Just as in the creation of wealth, it is the process of food production that can bring income to the vast majority of rural poor in the world. The primary cause of food insecurity in these countries is poverty (more than 1.3 billion people in this world survive on less than \$1 a day!). The development of local agriculture and increasing food production regionally across the world is key to addressing both hunger and low income. Genetically reprogrammed seed is “scale neutral” in that a poor rice farmer with one acre in Bangladesh can stand to benefit from it as much as the large farmer in California.

The current furore over genetically improved food, especially in Europe, has little to do with the safety of these foods. Public perceptions are being manipulated by the sensationalist tactics of fringe groups opposed to progress, and taken advantage of by politicians favoring trade protectionism. The decision by some food companies not to use genetically improved foodgrains in their processed foods is a knee-jerk response to scare tactics, born out of the need to protect their market share. It is also irresponsible as it sends a wrong message to consumers that there may be a safety issue with these genetically improved food products. Sound scientific evidence on the safety of these products has been completely ignored, while flawed studies or hypothetical arguments of activists are being given free play by the media.

It is ironic that such strong opposition to a technology that offers so much to advance food and nutritional security around the world has been mounted by environmental groups who really should be supporting the effort to increase the world’s supply of affordable food. Development of highly productive crops would put less pressure on agriculture to expand into wild and forest lands, and would also result in the reduced use of chemicals on the farm.

As with any technologies that we have embraced, biotechnology will have some adverse impact. However, just as we have not banished the automobile, Internet, air travel or immunization because of their negative impact or risks, we should strive to promote responsible integration of biotechnology in our agricultural research. Any concern about its impact on food safety and environmental impact must be addressed rationally and scientifically. To ignore or vilify biotechnology because of the miniscule risk or hypothetical hazards it poses would deny farmers and consumers the vast benefit it offers.

Ronald Cantrell of the International Rice Research Institute in the Philippines recently said, "To still have hunger in our world of abundance is not only unacceptable, it is unforgivable."

While European Greenpeace activists are busy scouring for new causes to fight for after the end of the cold war, let us remember that for nearly a billion people on this planet the only worthwhile cause is the struggle for daily bread. We have the means to end hunger on this planet and to feed the world’s six billion – or even nine billion – people. For the well fed to spearhead campaigns and suppress research into potential solutions for ideological or pseudo-scientific reasons is downright irresponsible and immoral.

References

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