

MEASURING GLOBAL PROGRESS TOWARD FOOD AND NUTRITION SECURITY

EXECUTIVE SUMMARY

While it took the world almost two thousand years to reach a population of one billion people, we are projected to grow by one billion people in just the next twelve years.¹ By the middle of the century, the global population will exceed 9 billion.² Creating a food secure world for such a large population is an enormous challenge, made even more complex by obstacles that affect our global food supply and the demographic and behavioral factors that contribute to changing diets.

In 2010, the world's population reached nearly 7 billion people,³ straining the world's natural resources and food system. At the time, estimates indicated that food production must increase anywhere from 70 percent to double to meet global food demand in 2050.⁴ This prompted stakeholders around the world including farmers, governments, civil society organizations, and agribusinesses to further mobilize to address the global food and nutrition security challenge.

Responding to this challenge, DuPont convened an Advisory Committee on Agricultural Innovation & Productivity (the "Committee") in 2010, which was tasked with exploring the global issues affecting food and nutrition security. The Committee examined the productivity of farmers around the world, advances in agricultural technology and innovation, capacity and infrastructure needs in various regions, policy and regulatory barriers to food and nutrition security, market access and trade, and sustainability issues.

In 2011, the Committee published its first report including recommendations for DuPont and the global community (Box 1).⁵ The Committee defined food security as a three-pronged challenge:

- Unleashing innovation to produce more and nutritionally better food;
- Ensuring access to food; and
- Making all efforts sustainable.

¹ United Nations (UN), World Population Projected to Reach 9.6 Billion by 2050 with Most Growth in Developing Regions, Especially Africa – Says UN, Press Release (June 13, 2013) *available at* https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CC4QFjAA&url=http%3A%2F%2Fesa.un.org%2Fwpp%2FDocumentation%2Fpdf%2FWPP2012_Press_Release.pdf&ei=9hp4UtmENdXTsATP9YCOBA&usg=AFQjCNFYArOuziaNWTytExOhr2HkofkBJQ&sig2=DwrAEsKZzKt6qIU-oWKYaA&bvm=bv.55819444.d.cWc.

² *Id.*

³ Population Reference Bureau, 2010 World Population Data Sheet (2010) *available at* http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&cad=rja&ved=0CDAQFjAB&url=http%3A%2F%2Fwww.prb.org%2Fpdf10%2F10wpds_eng.pdf&ei=hx9wUq67A8TWkQeM6ICgAQ&usg=AFQjCNFnUwx_s8NWvEto9y-6YxecHwYwaA.

⁴ Food and Agriculture Organization (FAO) of the United Nations, How to Feed the World in 2050 (Oct. 2009) *available at* http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&cad=rja&ved=0CC8QFjAB&url=http%3A%2F%2Fwww.fao.org%2Ffileadmin%2Ftemplates%2Fwfsfs%2Fdocs%2Fexpert_paper%2FHow_to_Feed_the_World_in_2050.pdf&ei=uOdvUu7vNcfJ4AOg34CgAw&usg=AFQjCNEvZBB2Wrep78tku_vCige3UqTm3Q.

⁵ DuPont Advisory Committee on Agricultural Innovation & Productivity for the 21st Century, Report and Recommendations (2011).

Two themes were also woven throughout the report as critical to food and nutrition security – the central role of farmers and the need for a comprehensive and collaborative approach across multiple partners and sectors.

Since the 2011 report, the Committee has monitored global progress on food and nutrition security issues and explored three aspects in greater depth – the role of technology and innovation in agriculture, opportunities for advancing nutrition security, and the need for environmentally, socially, and economically sustainable agricultural systems. The purpose of this report is to review the world’s progress toward food and nutrition security since 2011 and identify the continuing challenges.

In the short period since 2011, the world has made some progress toward eradicating extreme hunger and poverty. During this time, developing countries have managed to reach the point of nearly halving the proportion of those suffering from hunger.⁶ Indeed, at current rates, the prevalence of undernourishment in developing regions is expected to fall to 13 percent by 2015, just shy of the 12 percent target or half the rate of undernourishment during 1990 to 1992.⁷

In addition, from an efficiency perspective, global agricultural productivity is currently on track to enable meeting the greater global food demand.⁸ The food price spikes in recent years and accompanying concerns about the world’s ability to produce enough food have led to the development of new tools that can measure the underlying causes of global food and nutrition security. In turn, these tools have prompted a renewed focus on nutrition and its impact on our individual and global development. More emphasis is being placed on science-based solutions to help mitigate the shocks of biological and environmental stresses, such as extreme drought conditions, to increase global agricultural productivity. Ongoing trade negotiations hold the promise of enabling increased movement of food around the world. And, enhanced public-private sector collaborations are aimed at creating new, sustainable models for improving the livelihood of smallholder farmers.

The Committee applauds this progress. However, we cannot ignore the challenges that remain. One in eight people remains undernourished, indicating that much is left to be done. From getting all available tools to farmers, to building sustainable agricultural systems, and to empowering women farmers with resources, such as land and technical training, there is more work to do to achieve a food and nutrition secure world.

⁶ FAO, *The State of Food Insecurity in the World* (2013).

⁷ *Id.*

⁸ Global Harvest Initiative (GHI), *2013 GAP Report: Sustainable Pathways to Sufficient Nutritious and Affordable Food*.

UPDATE ON THE FOOD AND NUTRITION SECURITY LANDSCAPE

While the global food and nutrition security landscape has improved, the world continues to face the vast challenge of chronic hunger and malnutrition. Rapid population growth and longer life expectancies affect our ability to ensure everyone has sufficient access to affordable, nutrient-rich, and culturally appropriate food. Increasing wealth in emerging markets has led to a growing middle class that is expected to consume more resource-intensive food such as meat and dairy. Meanwhile, limited resources, such as water and arable land, necessitate that efforts to address growing food demand and changing diets be more sustainable in order to mitigate our environmental footprint.

Nevertheless, there are noteworthy areas of progress. In addressing the challenge ahead, the world is becoming a more efficient producer of food and focusing on the value of both the quantity and quality of our food supply. This section of the report highlights these and other positive steps the world is making toward global food and nutrition security:

- New data on productivity and population;
- New tools for measuring food and nutrition security;
- The emergence of nutrition on the global agenda;
- Farmer access to new tools and better practices;
- The movement of food through improved agricultural trade policies; and
- Private sector commitments and public-private sector collaborations.

New Data on Productivity and Population

The United Nations (UN) projects the world population to reach 8.1 billion by 2025 and 9.6 billion by 2050.⁹ Most of this growth will take place in the least developed countries, which are expected to double in size between now and 2050 (Box 2).¹⁰ Even accounting for the UN Food and Agriculture Organization's (FAO's) projected one-third decline in fertility in Africa by 2045-2050, the continent is expected to account for more than half of global population growth.¹¹

⁹ UN, World Population Projected to Reach 9.6 Billion by 2050 with Most Growth in Developing Regions, Especially Africa – Says UN, Press Release (June 13, 2013).

¹⁰ *Id.*

¹¹ *Id.*

Box 2. Projected Population Growth in Developing Regions

According to the FAO, Nigeria will surpass the population of the United States by the middle of the century.ⁱ Toward the end of the century, Nigeria could compete with China as the second most populous country in the world.ⁱⁱ Meanwhile, India and China are each expected to reach nearly 1.45 billion people by 2028, at which point India will continue to grow, reaching 1.6 billion over the next several decades.ⁱⁱⁱ

ⁱ UN, World Population Projected to Reach 9.6 Billion by 2050 with Most Growth in Developing Regions, Especially Africa – Says UN, Press Release (June 13, 2013).

ⁱⁱ *Id.*

ⁱⁱⁱ *Id.*

Despite rapid population growth, the world has improved its ability to more efficiently improve agricultural productivity. In 2011, based on the Global Harvest Initiative's (GHI's) measure of global agricultural productivity, the Committee reported that agricultural productivity would need to grow 25 percent faster than its current trajectory to meet growing food demand.¹² GHI indicated that sustainably doubling agricultural output – GHI's target amount for achieving global food security by 2050 – would require that “total factor productivity” (TFP) reach at least 1.75 percent each year.¹³ At the time, the growth rate was only 1.4 percent,¹⁴ clearly suggesting a much faster rate of growth was needed to close the productivity gap by mid-century.

Today, the growth rate has reached 1.81 percent, exceeding the target rate.¹⁵ If our current trajectory is maintained, the growth rate is sufficient to double agricultural supply by 2050 (Figure 1). However, while by this measure the world is on track to meet global food demand, this rate is not assured for the future. Building more efficient agricultural systems to meet global food demand and increasing resilience in the case of unexpected shocks, requires making the right investments and policy decisions now. Our current agricultural technologies and practices are the result of investments in research and development, in some cases, dating from more than a decade ago. Therefore, it is important that the global community carefully examine the types of tools and practices needed to advance food and nutrition security to inform its investment decisions.

¹² GHI, 2010 Global Agricultural Productivity (GAP) Report: Measuring Global Agricultural Productivity.

¹³ Total factor productivity (TFP) compares gross agricultural outputs (e.g., crops and livestock) to agricultural inputs (e.g., land, fertilizer, labor, livestock, machinery). Increases in TFP occur when total output increases while inputs remain constant.

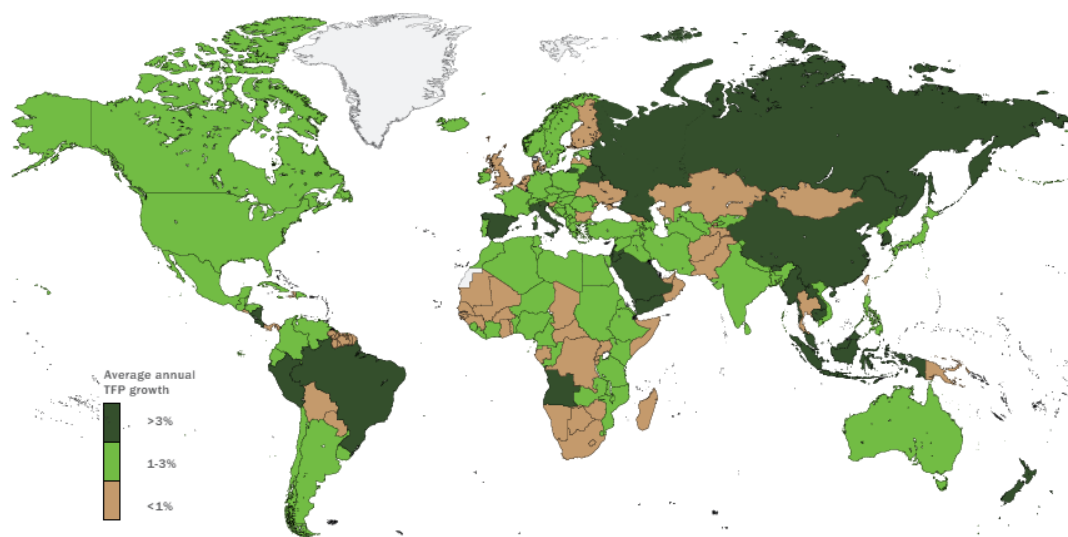
¹⁴ *Id.*

¹⁵ GHI, 2013 GAP Report: Sustainable Pathways to Sufficient Nutritious and Affordable Food.

Figure 1: Required Agricultural Growth Compared to Current Agricultural Growth

Source: GHI, 2013 GAP Report

Agricultural productivity gains alone, however, do not equate to global food and nutrition security. Producing enough food for the world is different from ensuring that countries have equal access to enough food and nutrients to meet domestic demand. In fact, despite global productivity gains, enormous regional variation persists. Many Sub-Saharan African countries have rates well below the target agricultural growth rate, while the Latin American and Caribbean region has a rate well above what is required for meeting domestic needs (Figure 2).

Figure 2: Total Factor Productivity Growth in Global Agriculture Since the Mid-1990s

Source: GHI, 2012 GAP Report

Narrowing the gap between aggregate food supply and demand will require a greater emphasis on sustainably improving agricultural productivity in countries that have the capacity for agricultural growth, but where millions are food and nutrition insecure (Box 3). In addition, particularly in food deficit regions, meeting global food demand will require increasing net agricultural productivity – the amount of food produced after taking into account food loss and waste. As discussed later in this report, a significant portion of the world’s annual food supply is lost or wasted along the value chain. Curbing food loss and waste is critical to building more productive and efficient agricultural systems.

Box 3. Nigeria's Agricultural Revolution

Since the 1960s, Nigeria has transitioned from a self-sufficient agricultural producer to a net importer of food – spending \$11 billion a year on rice, fish, and sugar.ⁱ Under the leadership of the Minister of Agriculture and Rural Development, Dr. Akinwumi Adesina, Nigeria has renewed its commitment and investment in agriculture to revolutionize the sector and its country. Nigeria is implementing market-based initiatives to boost the country's agricultural productivity to enable the country to reach its goals of adding 20 million tons of food to its domestic food supply by 2015 and creating 3.5 million jobs.ⁱⁱ For example, Nigeria is aiming to increase its local production of tropical wheat varieties and accelerate its capacity to domestically process cassava – one of the country's most important crops – into flour, sweeteners, and other products for domestic and global consumption. It is estimated that replacing wheat flour with cassava flour alone by 20 percent would save Nigeria 254 billion Naira each year – money that can in turn be reinvested into its agriculture sector.ⁱⁱⁱ

ⁱ Adam Robert Green, Agriculture is the Future of Nigeria, FORBES (Aug. 8, 2013).

ⁱⁱ Federal Ministry of Agriculture and Rural Development, Unlocking the Power of Agriculture to Create Wealth in Africa: The Nigerian Model, Keynote Address by Dr. Akinwumi Ayodeji Adesina (Oct. 14, 2013).

ⁱⁱⁱ *Id.*

New Tools for Measuring Food and Nutrition Security

Understanding global progress toward food and nutrition security requires the appropriate consensus-driven tools and metrics to accurately measure improvement over time. Since the Committee's 2011 report, several new tools have emerged (Box 4). The Global Food Security Index (GFSI), for example, is an interactive tool that governments, researchers, academia, nongovernmental organizations (NGOs), and the private sector can use to examine the drivers of food insecurity. Developed by the Economist Intelligence Unit and commissioned by DuPont, the GFSI spans 107 countries and is designed to facilitate a new dialogue about the obstacles and potential solutions to achieving global food and nutrition security by country.

Based on 27 qualitative and quantitative indicators and a quarterly food price adjuster, the GFSI annually evaluates what is and is not working in efforts to mitigate the risks to food security. Among key findings last year, the GFSI illustrated that indicators of good governance – political stability and democratic rights – improved food security in Myanmar and Sri Lanka.¹⁶ Likewise, dietary protein consumption had a high correlation with improved GFSI scores and showed increases in 62 percent of countries. This type of tool enables governments to set benchmarks based on performance and then implement local solutions and policies in an effort to track improvement. It also enables countries to monitor the potential disparate impact of such progress on vulnerable populations, which can be an unintended consequence of economic growth.

¹⁶ The Economist Intelligence Unit, Global Food Security Index 2013: An Annual Measure of the State of Global Food Security (2013).

Box 4. Food and Nutrition Security Indices		
Tool	Description	Developer
Global Food Security Index (GFSI)	The GFSI annually measures the risks to global food security. Applying 27 measures, the GFSI assesses 107 countries across three dimensions – affordability, availability, and food quality and safety.	The Economist Intelligence Unit (commissioned by DuPont)
Global Hunger Index (GHI)	The GHI comprehensively measures and tracks global hunger by country and by region. It is calculated each year, highlighting successes and failures in hunger reduction and providing insight into the drivers of global hunger. The GHI measures undernourishment, child underweight, and child mortality.	International Food Policy Research Institute (IFPRI)
Food Price Index	The Food Price Index measures the monthly change in international prices of a basket of food commodities. The commodities include cereals, vegetable oils, dairy, meat, and sugar.	Food and Agriculture Organization of the United Nations (FAO)
Access to Nutrition Index (ATNI)	The ATNI evaluates 25 food and beverage manufacturers on their policies, practices and performance related to obesity and undernutrition. Companies are evaluated on their corporate strategy, management, and governance related to nutrition; formulation and delivery of appropriate, affordable, and accessible products; and positive influence on consumer choice and behavior.	Global Alliance for Improved Nutrition (GAIN), Bill & Melinda Gates Foundation, and Wellcome Trust

Emergence of Nutrition on the Global Agenda

The Committee report noted that improving the nutritional content and quality of food to address global malnutrition, specifically undernutrition, is just as vital as increasing agriculture yields and calories. Since then, nutrition has become increasingly prominent on the global food security agenda, buttressed by a growing evidence base. In June 2013, *The Lancet* published a follow-up to its 2008 series on nutrition, re-examining the issues around maternal and child undernutrition and addressing the mounting concerns related to overweight and obesity.¹⁷ This heightened focus on nutrition has led to a growing national and global commitment to curbing malnutrition.

The implications for nutrition security are vast and the consequences of failing to address malnutrition are severe. The FAO estimates that undernutrition and micronutrient deficiencies

¹⁷ THE LANCET, 2013 Maternal and Child Nutrition Series (June 6, 2013) available at <http://www.thelancet.com/series/maternal-and-child-nutrition>.

cost two to three percent of global gross domestic product or \$1.4 to \$2.1 trillion each year.¹⁸ The overall cost of all non-communicable diseases, of which overweight and obesity are the primary drivers, is an estimated \$1.4 trillion.¹⁹ Addressing this double burden of malnutrition will require a range of approaches spanning education and dissemination of information, diversification of diets, improving the nutritional quality of food, and scaling up multisectoral approaches to improve the nutrition of children during the first 1,000 days of life.

Solutions and Multisectoral Approaches for Tackling Undernutrition

Today, there are nutrition-focused initiatives aimed at the underlying determinants of undernutrition. These efforts incorporate nutrition-specific interventions (*i.e.*, addressing the direct causes of malnutrition that have a specific impact on nutrition outcomes, such as food fortification and micronutrient supplementation) and nutrition-sensitive approaches (*i.e.*, strategies and programs that address the underlying causes of malnutrition and take into account the multisectoral impact of nutrition, such as access to clean water and sanitation) (Box 5).²⁰

Box 5. Nutrition-Focused Initiatives
<p>Scaling Up Nutrition (SUN) Movement: Launched in 2010, the SUN Movement is based on the principle that all people have a right to food and good nutrition. It is a country-focused effort that unites governments, civil society, the United Nations, donors, businesses, and researchers with the goal of effectively scaling up nutrition through nutrition-specific interventions and nutrition-sensitive approaches. A core focus of the SUN Movement is empowering women.</p>
<p>New Alliance for Food Security and Nutrition (New Alliance): Launched during the 2012 G8 Summit, African country leaders, corporate executives, and G8 countries pledged to partner through the New Alliance to invest in African agriculture and lift 50 million people out of poverty by 2022. The New Alliance aims to support national agriculture investment plans, including the Comprehensive Africa Agriculture Development Programme (CAADP) agricultural transformation agenda.</p>
<p>Global Nutrition for Growth Compact: In connection with the 2013 G8 Summit, the United Kingdom in partnership with other governments, donors and development agencies, international organizations, civil society, and the business and science industries committed to scale up political commitment, increase resources, and take timely and more coordinated action to address global undernutrition.</p>

As a result of this renewed focus on nutrition, the world is making some progress in reducing chronic hunger and undernutrition. The numbers of people suffering from chronic hunger have

¹⁸ FAO, *The State of Food and Agriculture: Food Systems for Better Nutrition* (2013).

¹⁹ *Id.*

²⁰ Manfred Eggersdorfer, et al. *The Road to Good Nutrition: A Global Perspective* (2013) available at http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&cad=rja&uact=8&ved=0CCUQFjAA&url=http%3A%2F%2Fwww.karger.com%2FArticle%2FPdf%2F178607&ei=wHUwU9vpCOfo2gXovIDgBw&usq=AFOjCNFbjj1_oQTG5k3COvMmixpJY16Z_A.

declined from the 868 million the FAO reported in 2012 to 842 million in 2013.²¹ And, the number of undernourished people has declined by 17 percent over the past two decades.²² Still, poor nutrition is the cause of nearly half of all deaths in children under age five every year.²³ Moreover, globally, roughly one in four children under age five is stunted due to micronutrient deficiencies, which is linked to permanent physical and mental impairments.²⁴ To continue to reverse these trends, we must support and scale the collaborative and innovative efforts that can have a sustainable effect on nutritional status. We must also continue to identify linkages across the agriculture, food, nutrition, and health sectors, and policies that can address all of the determinants that affect malnutrition.

Existing tools that improve food quality and safety should be more broadly disseminated. Since the early 20th century, food fortification strategies have been used to curb micronutrient deficiencies. For example, the iodization of salt to address iodine deficiency led to a significant increase in access to iodine, from 20 percent of the world's households in 1990 to 70 percent by 2008.²⁵ The Global Alliance for Improved Nutrition's (GAIN's) National Food Fortification Program has helped reduce the incidence of neural tube defects in South Africa by as much as 30 percent through fortification of maize meal and wheat flour with folic acid.²⁶ But, developing countries continue to face multiple micronutrient deficiencies. Eradicating these deficiencies will require greater leveraging of food fortification as a cost-effective and sustainable approach to address widespread undernutrition.

Biofortification through plant breeding also holds promise for improving the micronutrient content of crops that now have little nutrient value. Through enhancing the nutritional content of crops, biofortification can help alleviate micronutrient deficiencies that lead to blindness, anemia, and impaired mental and physical growth. However, this tool is not yet widely disseminated, partially due to the time and cost of research and regulatory approvals needed. Consequently, greater exploration of new business models or philanthropic partnerships may be needed to bring these important crops to market.

Other methods for addressing nutrient deficiencies include agronomic biofortification and diet diversity. Including micronutrients in fertilizers is a readily available and affordable way to increase the micronutrient content of crops and address human micronutrient deficiencies.²⁷ The importance of a diverse diet also cannot be stressed enough. Access to not only nutritious crops, but also animal products, such as fish, meat, and dairy, is essential to achieve a balanced diet that incorporates important micronutrients. Fish is the primary source of animal protein for over 1

²¹ FAO, *The State of Food Insecurity in the World* (2013).

²² *Id.*

²³ World Health Organization (WHO), *Children: Reducing Mortality*, Fact Sheet No. 178 (Sept. 2013) available at <http://www.who.int/mediacentre/factsheets/fs178/en/#>.

²⁴ United Nations Children's Fund (UNICEF), *Improving Child Nutrition: The Achievable Imperative for Global Progress* (April 2013).

²⁵ Copenhagen Consensus Center, *Best Practice Paper: Micronutrient Fortification (Iron and Salt Iodization)*, Working Paper (Oct. 2008).

²⁶ Global Alliance for Improved Nutrition (GAIN), *GAIN National Food Fortification Program* available at <http://www.gainhealth.org/programs/gain-national-food-fortification-program>.

²⁷ International Fertilizer Association (IFA) and International Plant Nutrition Institute (IPNI), *Fertilizing Crops to Improve Human Health: A Scientific Review* (Oct. 2012).

billion people worldwide.²⁸ Meat and dairy are also important as a source of protein and other nutrients. However, consuming animal proteins for calories and nutrients puts significant pressure on the planet's finite resources. As countries become wealthier, the demand for meat will increase, contributing to agriculture's environmental footprint.²⁹

Improving the world's nutritional status for a growing population will require finding more efficient and sustainable solutions to satisfy our increasing consumption of animal-based protein, which will outpace overall food consumption. For example, aquaculture – the farming of aquatic animals and plants – while not without its own environmental challenges, offers a more sustainable alternative to wild caught fish. During 2010, aquaculture produced almost half of the fish consumed globally, while wild fish harvests have stagnated since the 1990s.³⁰ In 2011, aquaculture reached a significant milestone by surpassing beef production for the first time.³¹ In addition, while beef consumption remains important to the human diet, milk and eggs will increasingly provide a more efficient source of calories and protein.

Finally, food protection solutions can reduce wastage and improve safety, enabling improved access to and availability of nutritious food. At least one-third of the world's food or nearly a quarter of all calories produced is wasted each year.³² Consumers are responsible for over half of the food loss and waste in developed countries, while in less developed countries, at least two-thirds of food loss and waste is due to poor harvesting, handling, and storage.³³ Reducing this level of loss and waste by half by 2050 could close the food gap by an estimated 20 percent, lessening the pressure on the world to increase net agricultural productivity to address food and nutrition security.³⁴ In Kenya, a joint collaboration between the Danish International Development Agency (DANIDA), DuPont Nutrition & Health, and Egerton University has resulted in the development of an enzyme technology that slows the onset of microbial spoilage in raw un-cooled milk. This can provide not only an economic benefit to farmers by increasing net income, but can extend its nutritional value. Food protection technologies also can detect foodborne pathogens before food reaches the shelves of grocery stores, increasing its overall safety.

It is also important to note that finding solutions to curb food loss and waste can help mitigate agriculture's impact on the environment. Wasted food utilizes a significant amount of land and contributes to greenhouse gas emissions. Uneaten food occupies roughly 30 percent of the world's agricultural land and is the third-highest emitter of greenhouse gases, after the United States and China.³⁵ The global community should place a greater priority on its efforts to

²⁸ World Resources Institute (WRI), *Creating a Sustainable Food Future: Interim Findings* (“WRI Interim Report”) (Dec. 2013).

²⁹ *Id.*

³⁰ *Id.*

³¹ Earth Policy Institute, *Farmed Fish Production Overtakes Beef* (June 12, 2013) *available at* http://www.earth-policy.org/plan_b_updates/2013/update114.

³² FAO, *Food Wastage Footprint: Impacts on Natural Resources*, Summary Report (2013); *see also* WRI Interim Report.

³³ WRI Interim Report.

³⁴ *Id.*

³⁵ FAO, *Food Wastage Footprint: Impacts on Natural Resources*, Summary Report (2013).

minimize food waste and loss to ensure access to more and higher quality food, while also addressing environmental challenges.

The Other Side of Malnutrition

Overweight and obesity are other forms of malnutrition. An estimated 1.4 billion people are overweight, 500 million of whom are obese.³⁶ It is now widely acknowledged that an increasing proportion of the overweight and obese live in developing countries.³⁷ In Mexico, for example, nearly one-third of adults are obese, surpassing the United States, which also nears one-third.³⁸ China's escalating rates of overweight and obesity are resulting in the world's highest prevalence of Type 2 diabetes – reaching almost 12 percent.³⁹ This new burden of disease in developing countries is largely attributed to the changing diets and physical inactivity associated with urbanization, economic development, and globalization.

The factors contributing to overweight and obesity are complex, but emerging tools can improve the health profile of food. From proteins, fibers, and cultures that are being used to improve cardiovascular and digestive benefits to ingredients that enable manufacturers to reduce the fat, sugar, caloric, and salt content of food and beverages, more is being done to make nutrition solutions more accessible. Manufacturers are also investing in product lines that supplement daily nutrient requirements.

But, such tools are only a small piece of addressing overweight and obesity. As with undernutrition, overweight and obesity have several underlying causes including genetic and environmental influences, global market forces affecting food prices, consumer demand for more convenient food choices, lack of education regarding the health and economic consequences of overweight and obesity, and food and agricultural policies. In the coming year, the Committee will explore many of the drivers of the growing rates of overweight and obesity around the world and the potential solutions.

Farmer Access to New Tools and Better Practices

As we noted in our earlier report, one key to achieving sustainable food security involves smallholder farmers. Today, there are an estimated 500 million small farms around the world.⁴⁰ These farms provide 80 percent of the food consumed in much of the developing world.⁴¹ Consequently, empowering smallholder farmers with all tools – from the most basic local practices to the most advanced technologies – as well as support services to connect them to markets will help them move from subsistence to surplus producers. This in turn has the dual effect of not only increasing the food supply, but also importantly improving the livelihoods of

³⁶ FAO, *The State of Food and Agriculture: Food Systems for Better Nutrition* (2013).

³⁷ *Id.*

³⁸ *Id.*

³⁹ Yu Xu, et. al. Prevalence and Control of Diabetes in Chinese Adults. *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. 2013;310(9):948-959.

⁴⁰ International Fund for Agricultural Development (IFAD), *Smallholders, Food Security, and the Environment* (2013) available at http://www.ifad.org/climate/resources/smallholders_report.pdf.

⁴¹ *Id.*

the poor – a vast majority of whom live in rural areas⁴² – thus advancing food and nutrition security.

Since the Committee’s report, advances in seed technology have enabled crops to better withstand biological and environmental stresses, thereby, increasing yield. The latest hybrid seed varieties, for example, can withstand the world’s more frequent drought conditions and yield 5 to 15 percent above non-drought tolerant varieties.⁴³

In addition, the adoption of agricultural biotechnology has continued to rise. In 2013, for example, 18 million farmers grew biotechnology crops.⁴⁴ Over 90 percent of those, or more than 16 million, were smallholders in developing countries.⁴⁵ In fact, for the second consecutive year, since the introduction of biotechnology crops, developing countries are growing more hectares than developed countries.⁴⁶

Farmers are also adopting other technologies such as modern irrigation practices, fertilizer, mobile technology, and mechanization to increase crop yields. By supplying crops with the essential nutrients often missing from soil, fertilizers can double or triple crop yields. Meanwhile, farmers are using mobile technology to create “smart” farms to remotely manage tasks, such as livestock feeding, fuel-tank monitoring, and spraying, making farm operations safer and more efficient.⁴⁷ Today, farmers are even using precision farming solutions, such as global positioning system (GPS) technology to increase yields with fewer inputs, leading to estimated productivity gains of 10 percent and average input savings of 15 percent.⁴⁸

However, non-technological solutions can also greatly improve the livelihoods of farmers. Many farmers lack sufficient access to the extension services necessary to improve their yields. On average, women comprise approximately 43 percent of the agricultural work force in developing countries.⁴⁹ Yet, only 15 percent of extension agents are women and only 5 percent of women have access to extension services.⁵⁰ And many smallholder farmers, particularly women, lack the access to financing mechanisms that enable them to adopt new technologies. Without these support services, farmers are unable to achieve the potential of their farms.

⁴² World Bank, Agriculture & Rural Development *available at* <http://data.worldbank.org/topic/agriculture-and-rural-development>.

⁴³ Dan Piller, Drought-Tolerant Seeds Coming in Few Months, THE DES MOINES REGISTER (Aug. 31, 2012) *available at* <http://usatoday30.usatoday.com/money/industries/food/story/2012-09-03/drought-tolerant-seeds/57480902/1>.

⁴⁴ International Service for the Acquisition of Agri-Biotech Applications (ISAAA), ISAAA Brief 46-2013: Executive Summary (2013).

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ KETV, New Technology Turns Field into Smart Farm (June 14, 2013) *available at* <http://www.ketv.com/news/local-news/new-technology-turns-field-into-smart-farm/-/9674510/20574222/-/14766wuz/-/index.html>.

⁴⁸ Pham, Nam, D. The Economic Benefits of Commercial GPS Use in the U.S. and the Costs of Potential Disruptions, NDP Consulting Group (June 2011) *available at* <http://www.ndpconsulting.com/docs/GPS%20Report%20June%2021%202011.pdf>.

⁴⁹ Global Forum for Rural Advisory Services, Fact Sheet on Extension Services, Position Paper (June 2012).

⁵⁰ *Id.*

As discussed in greater detail below, improving yield and moving beyond subsistence farming must also be coupled with access to markets and better trade policies if farmers are to become more food and nutrition secure. Farmers who are connected to the agricultural value chain generate higher incomes, enabling them to produce more and higher quality crops and, ultimately, contribute to overall economic growth and food and nutrition security.⁵¹

The Movement of Food through Improved Agricultural Trade Policies

While the focus must remain on increasing the quantity and quality of the world's food supply, the fact remains that some regions of the world are not as well endowed with land and water resources and face more difficult climatic conditions. The movement of food across borders and from centers of production to centers of living is, therefore, also a crucial ingredient of global food and nutrition security. In particular, with the world population becoming ever more urban and concentrated, trade policies will continue to be critical to ensuring that food can move freely and safely around the world to places that cannot meet their own food demand. Indeed, in the 2011 report, the Committee noted that the unrestricted movement of food around the world would become increasingly important, which is proving true. For example, China is facing a growing population and middle class that will result in changing diets and increased food consumption.⁵² Its economic growth and changing demographic will make it increasingly reliant on imports in the coming years to close the gap between its domestic demand and production.⁵³

Global reliance on agricultural trade makes new trade agreements increasingly central to food and nutrition security. Two important ones now being negotiated include a large proportion of the world's population and commerce. One is the Transatlantic Trade and Investment Partnership (TTIP) between the United States and the European Union, which would be the largest bilateral trade agreement ever negotiated. The other is the Trans-Pacific Partnership Agreement (TPP), which is nearing completion and will forge a deeper partnership between the United States and eleven Asian-Pacific countries.⁵⁴

Given the extent of agricultural trade between the United States, the European Union, and the Asian-Pacific region, agriculture will be a key component of these agreements. In 2012, agricultural trade between the United States and the European Union reached \$26.5 billion,⁵⁵ while the United States exported \$106 billion of agricultural products to the Asia-Pacific region, representing 75 percent of its total agricultural exports.⁵⁶ Agriculture is expected to also be an important component of ongoing trade negotiations between the European Union and a number

⁵¹ International Fund for Agricultural Development (IFAD), *Access to Markets: Making Value Chains Work for Rural People* (Sept. 2012).

⁵² GHI, 2013 GAP Report.

⁵³ *Id.*

⁵⁴ Office of the United States Trade Representative (OSTR), *Readout of This Week's Trans-Pacific Partnership Discussions in Washington, DC, Fact Sheet* (Sept. 23, 2013) available at <http://www.ustr.gov/about-us/press-office/press-releases/2013/September/Readout-Washington-TPP-discussions>.

⁵⁵ Business Coalition for Transatlantic Trade, Food and Agriculture/SPS, *Overview* available at <http://www.transatlantictrade.org/issues/food-and-agriculture/>.

⁵⁶ Office of the United States Trade Representative, *Trans-Pacific Partnership, Overview* available at <http://www.ustr.gov/about-us/press-office/fact-sheets/2011/november/united-states-trans-pacific-partnership>.

of African countries, holding the promise for improved food and nutrition security in those regions.⁵⁷

However, while we may be nearing an opportunity for increasingly open trade among these countries due to decreased tariffs, non-tariff barriers still greatly affect the extent to which agriculture is exported and imported around the world. European Union countries, for example, remain reluctant to adopt agricultural biotechnology and restrict the cultivation of genetically-modified crops.⁵⁸ An important element of successful trade negotiations such as the TPP and TTIP must be to ensure more science-based sanitary and phytosanitary measures and respect for internationally agreed upon standards.

In addition, efforts to reinvigorate the Doha Development Agenda, multilateral negotiations involving all World Trade Organization (WTO) member countries, should be supported. The WTO must also continue vigilant oversight of members' international trade obligations, as well as the resolution of country disputes to ensure greater transparency, implementation, and enforcement of commitments that impact the liberalization of agricultural trade.

Private Sector Commitments and Public-Private Sector Collaborations

The Committee and DuPont believe that new and creative collaborations that involve multiple sectors are needed to successfully identify and fully implement new, scalable, and sustainable solutions to the food security challenge. With recent attention to food and nutrition security, new public-private sector partnerships and organizations are finding novel ways to address the challenges. Examples include:

- **Climate Risk Mitigation Project:** Swiss Re leveraged its insurance expertise to collaborate with the public sector to improve the livelihoods of smallholder farmers in the Americas, Africa, and Asia.⁵⁹ The three-year partnership with the United States Agency for International Aid (USAID) was aimed at providing better access to customized, market-based insurance products that could enable farmers to mitigate the shocks of droughts, floods, and other natural hazards. The partnership offered farmers the risk-management solutions necessary to help them more confidently invest in new solutions to boost their productivity.
- **Grow Africa:** Grow Africa is a partnership platform aimed at accelerating investments in agriculture based on country-specific priorities.⁶⁰ Created by the African Union, the New Partnership for Africa's Development (NEPAD), and the World Economic Forum, Grow Africa builds on public-private partnership models piloted by the World Economic

⁵⁷ European Commission, Trade Policy, Countries and Regions – West Africa *available at* <http://ec.europa.eu/trade/policy/countries-and-regions/regions/west-africa/>.

⁵⁸ European Commission, Rules on GMOs in the EU - Ban on GMOs Cultivation *available at* http://ec.europa.eu/food/food/biotechnology/gmo_ban_cultivation_en.htm.

⁵⁹ United States Agency for International Development (USAID), USAID Swiss Re-Partnership Targets Hunger, Natural Disasters, Press Release (Oct. 20, 2011) *available at* <http://www.usaid.gov/news-information/press-releases/usaid-swiss-re-partnership-targets-hunger-natural-disasters>.

⁶⁰ Grow Africa *available at* <http://growafrica.com/about>.

Forum's New Vision for Agriculture Initiative. In 2012, the New Alliance for Food Security and Nutrition in partnership with Grow Africa, announced \$3 billion in private sector commitments to facilitate transformative agricultural change on the continent.

- **Enterprise EthioPEA:** USAID, PepsiCo, and the World Food Programme (WFP) partnered to improve the livelihoods of local farmers by strengthening domestic and export chickpea markets in Ethiopia and addressing nutrition insecurity.⁶¹ Through leveraging PepsiCo's resources and expertise in chickpeas, the two-year Enterprise EthioPEA initiative aimed to help 10,000 farmers raise their yields and become active in the global market, while enabling the development of ready-to-use food for over 40,000 malnourished children.

Private sector partners are essential to implement and fully scale successful and comprehensive models that address food and nutrition security. These types of multi-stakeholder partnerships are critical to addressing the agricultural investment gap in developing countries. This gap indicates the overall domestic and international investments required for developing countries to achieve the necessary growth in output by 2050 as compared to current investments.⁶² While the gap for low- to middle-income countries declined somewhat from \$89 billion to \$79 billion since the Committee report, it still is significant and highlights the importance of public and private sector investment and partnerships.⁶³

Many private sector organizations are providing leadership in this space. For example, Unilever has committed to helping countries meet the Millennium Development Goals (MDGs) by 2015 through a range of efforts including the company's involvement in multisectoral nutrition-focused initiatives and making food products more accessible and affordable.⁶⁴ In addition, Cargill has invested in efforts to address food and nutrition security in the developing world, including providing research and resources for building more efficient supply chains that enable farmers to move food from surplus to deficit areas.⁶⁵ In response to the Committee recommendations in the 2011 report, DuPont has also undertaken several initiatives to address the global food security challenge, including launching its Food Security Goals (Box 6).

⁶¹ PepsiCo, PepsiCo, World Food Programme and USAID Partner to Increase Food Production and Address Malnutrition in Ethiopia, Press Release (Sept. 21, 2011) *available at* <http://www.pepsico.com/PressRelease/PepsiCo-World-Food-Programme-and-USAID-Partner-to-Increase-Food-Production-and-A09212011.html>.

⁶² GHI, 2012 GAP Report.

⁶³ *Id.*

⁶⁴ Unilever, MDG Index *available at* <http://www.unilever.com/sustainable-living/assurancedataandcommentary/mdgs/>.

⁶⁵ Cargill, Cargill's Role in Addressing Food Security (May 2012) *available at* <http://www.cargill.com/wcm/groups/public/@ccom/documents/document/na3059574.pdf>.

Box 6. DuPont Food Security Goals

Innovating to feed the world. DuPont committed \$10 billion to R&D and the introduction of 4,000 new products by the end of 2020. The work will center on producing more food; enhancing nutrition and food and agriculture sustainability; boosting food availability and shelf life; and reducing waste.

Engaging and educating youth. By the end of 2020, DuPont will facilitate 2 million engagements with young people around the world to transmit that knowledge.

Improving rural communities. DuPont will work to improve the livelihoods of at least 3 million farmers and their rural communities through target collaborations and investments that strengthen agricultural systems and make food more available, nutritious and culturally appropriate. This is in addition to the work already being done to enhance the lives of hundreds of millions of farmers through DuPont's normal business practices.

REMAINING FOOD AND NUTRITION SECURITY CHALLENGES

Despite the world's progress, the Committee and DuPont recognize that many challenges remain that will require the work and commitment of global stakeholders. During the next few years, the Committee and DuPont will continue to explore these challenges including the barriers to technology acceptance, gender inequality, urbanization, and agricultural sustainability.

Barriers to Technology Acceptance

One major challenge to advancing food and nutrition security relates to fear and misperceptions about the role of science and technology in agriculture and food. While more and more farmers are using advanced seed technology to improve their yields and livelihood, many barriers to access still persist in regions around the globe. Meeting the world's growing food requirements means that all farmers, particularly smallholders, have access to all tools that enable a more abundant, healthier, and safer food supply. To this end, as noted earlier, the global community should closely examine the solutions needed to advance food and nutrition security to ensure investments in the full range of technologies for farmers. And, the global community should strive to strengthen science-based regulatory frameworks for the approval of such technologies. In addition, farmers should have greater access to information about new science-based solutions to advance their acceptance of modern technologies. The Committee suggests it is also important to better inform consumers about modern agriculture, how food is grown, and the promise of new scientific advances to improve our food supply.

Gender Inequality

Many issues beyond investment in technology exist that can improve food security if addressed. For example, addressing gender inequality would enable great strides in food and nutrition security. While women represent the majority of the agricultural work force in over 30 countries, due to obstacles including poor governance, limited access to land, and insufficient

credit, women farmers are unable to realize their potential.⁶⁶ The FAO estimates that if women had the same access to resources as men, they could increase their crop yields by as much as 30 percent.⁶⁷ This increase alone could raise total agricultural output in developing countries by as much as 4 percent, reducing the number suffering from hunger by as much as 150 million people.⁶⁸ Empowering women not only with the resources to increase food production but also with access to health care, education, training to enhance their expertise, and leadership skills translates into healthier families and communities. The Committee will take a closer look at the role of women in meeting global food demand, particularly with respect to improving the nutritional status of children facing malnutrition.

Urbanization

Urbanization and changing demographics will also alter the food security landscape. By 2050, 70 percent of the world will live in cities.⁶⁹ Some of this urbanization will occur naturally as farmers look to cities for work, while in some countries there is a national concerted effort to catalyze this shift (Box 7). Rapid urbanization will result in more people living farther away from where their food is grown, straining scarce resources and likely increasing demand for processed food. These shifts will require new and comprehensive approaches to more efficiently move food from farms to cities, to address natural resource challenges, and to provide consumers with access to affordable, healthy food options. The Committee will explore the complexities of urbanization in emerging markets and its effect on overnutrition, trade, and sustainability.

⁶⁶ The World Bank and ONE, *Levelling the Field: Improving Opportunities for Women Farmers in Africa* (March 2014) (citing FAO, *The State of Food and Agriculture 2010-11: Women in Agriculture* (2011)).

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ UN, *World Urbanization Prospects, The 2011 Revision* (March 2012).

Box 7. The Urbanization of China

As the world's second largest economy, China has emerged as a leader in economic and social development.ⁱ Indeed, over 600 million people have transitioned out of poverty, making China the first developing country to halve the number of those living below US\$1.25.ⁱⁱ And, China aims to move 250 million rural residents into cities by 2025.ⁱⁱⁱ In addition, China's rapid growth has enabled it to invest billions of dollars in countries throughout Africa.^{iv}

But, China's progress is not without its challenges. China's urban development and growing economy – over a 21 percent expansion of its middle class each year – has led to a widening gap between food supply and demand and changing dietary preferences.^v The country's food demand is projected to grow threefold by 2030 and consumption patterns have shifted from grain-based diets to include more animal-based protein.^{vi} Meanwhile, China has the second highest number of the world's poor.^{vii}

With rapid urbanization, China will face food and nutrition security challenges including ensuring enough food is available to meet national demand and that the infrastructure is in place to transport food away from farms. Providing access to basic needs including health care, education, affordable housing, and jobs will also be important. In the coming decades, China will serve as a guidepost for both the challenges and opportunities that lie ahead for emerging markets in terms of domestic production, its participation in the global market, and its ability to address the needs of a new urban population.

ⁱ The World Bank, China Overview *available at* <http://www.worldbank.org/en/country/china/overview>.

ⁱⁱ China Central Television, UN official praises China's Poverty Reduction (Oct. 17, 2013) *available at* <http://english.cntv.cn/20131017/104761.shtml>.

ⁱⁱⁱ Ian Johnson, China's Great Uprooting: Moving 250 Million Into Cities, THE NEW YORK TIMES (June 15, 2013) *available at* <http://www.nytimes.com/2013/06/16/world/asia/chinas-great-uprooting-moving-250-million-into-cities.html?pagewanted=all>.

^{iv} Bartholomäus Grill, Billions from Beijing: Africans Divided over Chinese Presence, SPIEGEL ONLINE INTERNATIONAL (Nov. 29, 2013) *available at* <http://www.spiegel.de/international/world/chinese-investment-in-africa-boosts-economies-but-worries-many-a-934826-3.html>; *see also* Daniel Flynn, Africa Investment-China Brings Goods and Roads, Now Africa Wants Jobs, REUTERS (July 21, 2013) *available at* <http://www.reuters.com/article/2013/07/21/africa-china-idUSL6N0F13TE20130721>.

^v GHI, 2013 GAP Report.

^{vi} *Id.*

^{vii} World Bank, China - Country Partnership Strategy for the Period FY2013-FY2016 (Oct. 11, 2012).

Agricultural Sustainability

We will also continue to face challenges around building agricultural systems that are sustainable. Agriculture utilizes an estimated 70 percent of the world's available fresh water⁷⁰ for the irrigation of crops and roughly 50 percent of its habitable land.⁷¹ As a result, the global community should adopt environmentally sustainable tools and practices such as improved seed,

⁷⁰ UN, Water Statistics – Water Resources *available at* <http://www.unwater.org/statistics/en/>.

⁷¹ World Wildlife Fund, Farming: Habitat Conversion & Loss *available at* http://wwf.panda.org/what_we_do/footprint/agriculture/impacts/habitat_loss/.

no-till farming, and better crop and livestock management practices that can help reduce agriculture's environmental footprint.

Any approach to advance food and nutrition security must also be socially sustainable. In addition to empowering women, we must inspire young people to join the food and agriculture sectors by making farming an attractive profession. Through greater investment in youth development organizations, such as the National 4-H Council, Future Farmers of America (FFA), and land grant universities, we must continue to educate our youth on the challenges of sustainably feeding the world (Box 8). In addition, we must continue to move beyond traditional extension systems and connect agriculture to 21st century technologies and social media to engage the next generation of farmers (Box 9).

Finally, the agricultural systems for the future must be economically sustainable. As the bedrock of our society, we must increase our investment in the agriculture sector worldwide and build stronger value chains to which farmers can connect, thereby improving their livelihoods while strengthening the global economy. We should identify partnerships that are effective, scalable and provide potential for long-lasting benefit.

Box 8. 4-H Enterprise Gardens

As of 2013, 4-H, in partnership with DuPont, has launched Enterprise Gardens for youth in Tanzania, Kenya, and Ghana. The program has reached over 75,000 young people. The gardens are intended to empower and engage youth through active participation in agriculture production, as well as serve as a sustainable food program for school children and their communities. Highlights from a survey of participants indicated –

- 85% wanted to participate in the 4-H Enterprise Garden project next year;
- 80% wanted to pursue agriculture as a career;
- 80% wanted to pursue agriculture at the tertiary level; and
- 83% were interested in staying in school because of 4-H.

Box 9. The Connected Farmer Alliance

In 2012, TechnoServe, Vodafone and USAID partnered to develop the Connected Farmer Alliance across Kenya, Mozambique, and Tanzania.¹ The public-private partnership is intended to leverage mobile applications that will enable 500,000 rural farmers, including 150,000 women, to make and receive payments securely, access banking and financial services, and connect to local and multinational agribusinesses. By engaging agribusiness partners, farmers can receive agronomic or market information, extension services, and input crediting, creating supply chain efficiencies for farmers wanting to connect to commercial markets and improve their livelihoods.

¹ TechnoServe, Projects – Connected Farmer Alliance available at <http://www.technoserve.org/our-work/projects/connected-farmer-alliance>.

CONCLUSION

Since the Committee's 2011 report, the world has moved in a positive direction toward achieving food and nutrition security. We have made progress in realizing the potential of science and technology to improve agricultural productivity. We have new tools that enable the global community to better measure food and nutrition security advancement. There is a renewed focus on nutrition that has contributed to the implementation of better approaches to address the spectrum of global malnutrition. International trade agreements may lead to more open agricultural trade among country partners. And, increasingly, the public and private sectors are working to develop new partnerships aimed at strengthening local value chains to empower smallholder farmers. Nonetheless, we cannot ignore the significant challenges that remain. In the coming years, it will take continued collaboration among all stakeholders, greater commitment and investment in the agriculture sector, and better public policies to overcome the vast and complex challenges to achieving food and nutrition security.

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The DuPont Advisory Committee on Agricultural Innovation and Productivity is a group of experts in global agriculture development, science, policy, and economics. The Committee includes former Senator Tom Daschle (chair); Jason Clay, Senior Vice President of Market Transformation at the World Wildlife Fund; Charlotte Hebebrand, Director General of the International Fertilizer Industry Association; Jo Luck, former President and CEO of Heifer International and World Food Prize Laureate; Ruth Oniang'o, Founder and Director of Rural Outreach Africa; J.B. Penn, Chief Economist for Deere & Co.; and Pedro Sanchez, Director of the Agriculture and Food Security Center at The Earth Institute, Columbia University and World Food Prize Laureate.

Box 1. 2011 DuPont Committee Recommendations	
Prong	Recommendation
Produce More Food and Increase the Nutritional Value of Food	<p>Enable farmers everywhere to be more productive.</p> <p>Improve productivity through investment in extension, education, and best practices.</p> <p>Increase public research and development funding.</p> <p>Promote public and private collaboration on indigenous crop investment and nutritional enhancement.</p> <p>The agriculture sector should partner globally with governments, other private sector companies in the value chain, and NGOs to offer financing mechanisms so farmers can afford the tools to produce more.</p> <p>Ensure that intellectual property rights, competition and farmer benefits from innovation go hand-in-hand.</p>

Box 1. 2011 DuPont Committee Recommendations	
Prong	Recommendation
Make Food Accessible and Affordable for Everyone	<p>Governments should strengthen social safety net programs to ensure the most vulnerable have access to food.</p> <p>Global infrastructure investments are needed to ensure movement of food from areas of surplus to areas of deficit. Investments must also be made in processing and storage facilities to prevent postharvest loss.</p> <p>Increases in productivity must be coupled with access to markets, particularly for smallholder farmers. Stakeholders should facilitate and invest in models that better link smallholders to the global value chain.</p> <p>The private sector must work with governments to foster a more open and equitable trading system for food and agricultural products.</p> <p>Governments and policymakers should reconsider policies on subsidies and examine alternative safety net policies.</p> <p>Ensure science-based regulatory frameworks and remove regulatory barriers to achieving food security.</p>
Address the Challenge in a Continuously More Sustainable and Comprehensive Way	<p>Environmental – Investment must be made in technology and best practices for continuous improvement of agriculture sustainability and resource efficiency.</p> <p>Social – Both the public and private sector should invest in education and youth development efforts.</p> <p>Economic – Governments should take steps to reduce risk and create incentives for private sector investments. Companies should consider increasing long-term investments in emerging markets.</p>