

Achieving Sustainable Food Security: New Trends and Emerging Agenda

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Multistakeholder Dialogue on Implementing Sustainable Development,
United Nations Headquarters, New York, February 1, 2010

Food availability, stability, access, and utilization are essential for the wellbeing and productivity of all people. The current state of global food security raises serious concerns as the number of hungry has surpassed 1 billion people and emerging trends are further threatening global food supply. The forces challenging food security include population growth and demographic changes, high and volatile food prices, land and water constraints, and climate change. In Sub-Saharan Africa, these global stress factors put pressure on already fragile food security and agroecosystems. Region-specific stress factors, which worsen the situation for the food insecure and vulnerable groups, include weather-related shocks, poor infrastructure, undeveloped markets, as well as weak governance and institutions. A comprehensive policy and investment agenda for achieving sustainable food security is needed to: (i) improve smallholder productivity and market access; (ii) keep trade open; (iii) promote productive social safety nets; (iv) integrate climate change into strategies at all levels; and (v) harmonize food security and sustainability policy;

Global food security under stress

Global progress in ensuring food security and reducing poverty has been substantial, but not satisfactory. Significant advancements have been made in reducing hunger through intensifying staple food production, integrating people and the environment, expanding the role of markets, diversifying out of major cereals, reforming economy-wide policies, and improving food quality and human nutrition in the past five decades.¹ The population living in poverty, on \$1.25 a day, decreased from 29 percent to 18 percent between 1990 and 2005.² Yet, according to the 2009 Global Hunger Index—a combined measure of the proportion of undernourishment, child malnutrition, and child mortality—global hunger has improved only slightly since 1990, with 29 countries exhibiting “alarming” or “extremely alarming” levels of hunger.³ The number of hungry people has been on the rise since the mid-1990s, climbing up to more than 1 billion in 2009, largely due to the food and financial crises. Even before the crises hit, the poorest of the poor were left behind. About 160 million people were ultra poor, living on less than 50 cents a

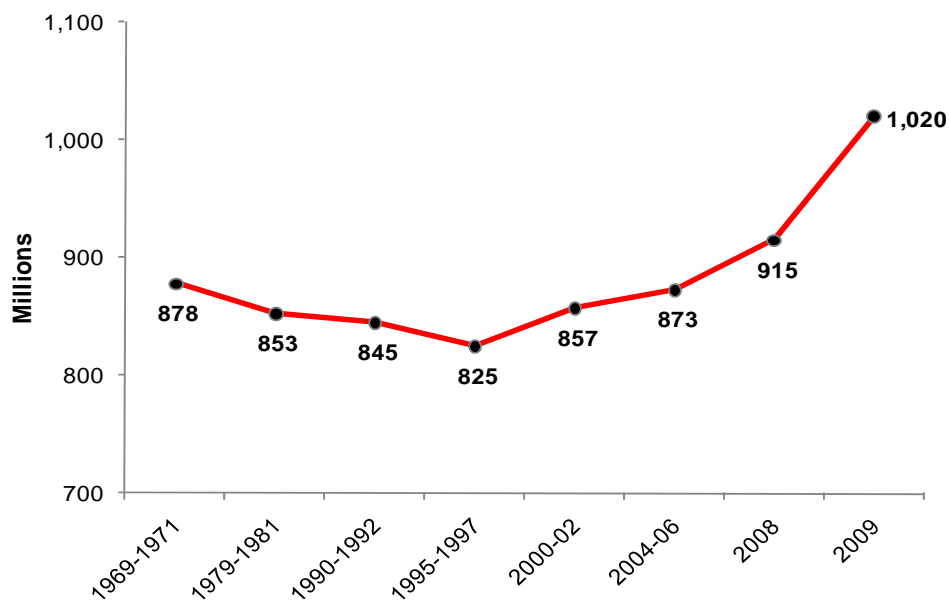
¹ Spielman, D. and R. Pandya-Lorch. 2009. Millions fed: Proven successes in agricultural development. Washington, D.C.: IFPRI.

² Chen, S. and M. Ravallion, 2008. The developing world is poorer than we thought, but no less successful in the fight against poverty. Policy Research Paper 4703. World Bank, Washington, D.C.

³ von Grebmer, K., B. Nestorova, A. Quisumbing, R. Fertziger, H. Fritschel, R. Pandya-Lorch, and Y. Yohannes. 2009. Global Hunger Index. The challenge of hunger: Focus on financial crisis and gender equality. Bonn, Washington, D.C., and Dublin: Deutsche Welthungerhilfe, IFPRI, and Concern.

day.⁴ High food prices also exacerbated diet quality and increased “hidden hunger”—deficiencies of important micronutrients such as vitamin A, iron, and zinc.

Figure 1. Number of undernourished people, 1969-71 to 2009



Source: FAO (Food and Agriculture Organization of the United Nations). 2009. More people than ever are victims of hunger. Press release, June 19.

The world food and financial crises disproportionately hurt certain groups, such as children and women. Since good nutrition is especially important for the physical and cognitive development of children, as well as for their productivity and earnings as adults,⁵ the impact of food insecurity on children today will have long-term consequences into the future. The crises also put under severe stress smallholders, which constitute the largest number of farmers and are for a large extent net food consumers. Smallholders, who had already been challenged by limited resources, insufficient access to technology, markets, finance, and infrastructure, as well as lack of economies of scale, experienced increased debt, credit shortage, and impediments in planning due to high price volatility.

The food and financial crises clearly demonstrate that food security is highly dependent on non-food policies related to energy, trade, and finance. The sharp spike of food prices in 2007-08 can be attributed to factors such as high oil prices, increased biofuel production, and newly-imposed export restrictions to protect food supplies. The expansion of biofuel production, for example, has created new linkages, trade-offs, and competition between the agricultural and energy sectors

⁴ Ahmed, A. U., R. Vargas Hill, L. C. Smith, D. M. Wiesmann, and T. Frankenberger. 2007. *The world's most deprived: characteristics and causes of extreme poverty and hunger*. Washington, D.C.: IFPRI.

⁵ Hoddinott, J., J. A. Maluccio, J. R. Behrman, R. Flores, R. Martorell. 2008. Effect of a nutrition intervention during early childhood on economic productivity in Guatemalan adults. *The Lancet* 371 (610): 411-416.

and introduced new food-security risks for the poor.⁶ The importance of trade policies for food security has also been exemplified by the latest food price crisis. Together with panic purchases, export restrictions accounted for the majority of the increase in world rice prices in 2007-08.⁷ There is also substantial evidence that the food price spike was caused by the financial activity in futures markets and speculation.⁸

Looking forward, continued global population growth and changing demographic patterns, coupled with income growth will put increased pressure on food supplies and already scarce natural resources. By 2050, the world population is projected to reach 9 billion, with growth coming predominantly from urban areas and from developing countries.⁹ The urban population is expected to grow even faster than the overall population and increase from 3.3 billion in 2007 to 6.4 billion in 2050.¹⁰ Rural-urban migration is not only increasing food demand, but also changing the quality, diversity, and composition of the food demanded. In urban areas, the consumption basket is shifting from staple foods to high-value foods such as meat, dairy, fruit and vegetables.¹¹ Consumers also demand more processed and ready-to-eat foods and are increasingly concerned about food quality and safety.¹² Population growth will also increase pressure on land and water resources. For example, world water availability is projected to shrink by one third from 7130 m³ per capita in 2000 to 4751 m³ per capita in 2050 due to population growth alone.¹³

Increased constraints in terms of natural resources indeed put severe pressure on agricultural sustainability and food security. According to the Global Assessment of Land Degradation and Improvement, 24 percent of the land surface is now affected by degradation, compared to 15 percent in 1991.¹⁴ Degradation has spread to more than 20 percent of cultivated cropland and affected the lands on which about 1.5 billion people directly depend on. In large parts of Africa, Asia, and the Middle East water resources are under stress due to factors such as arid climate,

⁶ See for example von Braun, J. and R. K. Pachauri. 2006. The promises and challenges of biofuels for the poor in developing countries. Washington, D.C.: IFPRI; von Braun, J. 2007. The world food situation – new driving forces and required actions. Food Policy Report. Washington, D.C.: IFPRI.

⁷ Headey, D., S. Malaiyandi, and S. Fan 2009. Navigating the perfect storm: Reflections on the food, energy, and financial crises. IFPRI Discussion Paper 00889. Washington, D.C.: IFPRI.

⁸ Cooke, B. and M. Robles. 2009. Recent food prices movements: A time series analysis. IFPRI Discussion Paper No. 00942. Washington, D.C.: IFPRI.

⁹ FAO (Food and Agriculture Organization of the United Nations). 2009. How to feed the world in 2050. Rome.

¹⁰ United Nations World Urbanization Prospects: The 2007 Revision. Available at: <http://www.un.org/esa/population/publications/wup2007/2007wup.htm>.

¹¹ See for example Gulati, A., N. Minot, C. Delgado, and S. Bora. 2007. Growth in high-value agriculture in Asia and the emergence of vertical links with farmers. In *Global supply chains, standards and the poor*, ed. J. Swinnen, 91–108. Wallingford, UK: CABI Publishing; Pingali, P. 2007. Westernization of Asian diets and the transformation of food systems: Implications for research and policy. *Food Policy* 32(3): 281–298.

¹² See for example Swinnen, J. 2007. *Global supply chains, standards and the poor*. Wallingford, UK: CABI Publishing.

¹³ Rosegrant, M.W., C. Ringler, T. Sulser, M. Ewing, A. Palazzo, T. Zhu, G.C. Nelson, J. Koo, R. Robertson, S. Msangi, and M. Batka. 2009. Agriculture and food security under global change: Prospects for 2025/2050. Background note for supporting the development of CGIAR Strategy and Results Framework.

¹⁴ Bai, Z.G., Dent D.L., Olsson L. and Schaepman M.E. 2008. Global assessment of land degradation and improvement. 1. Identification by remote sensing. Report 2008/01 (GLADA Report 5), ISRIC – World Soil Information, Wageningen.

irrigation for agriculture, and increase in the use of water for other uses such as industry. Many water sources are almost fully utilized, and supply needs to increase by at least one-third to support agriculture by 2030.¹⁵ Also by 2030, severe water stress is projected to affect about half of the world's population.¹⁶ IFPRI has adapted its modeling tools to capture the importance of natural constraints for the growth and sustainability of agricultural production. For example, IFPRI's International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT), a partial equilibrium model which simulates the behavior of a competitive world agricultural market for crops and livestock, has been expanded to include a Water Simulation Model to better assess water constraints to future food production and human well-being.¹⁷

Climate change will put additional pressure on natural resources and food insecurity. Climate change threatens agricultural production through higher and more variable temperatures, changes in precipitation patterns, and increased occurrences of extreme events such as droughts and floods. In 2050, global production of wheat and rice is projected to be 27 and 14 percent lower than in 2000 due to climate change.¹⁸ Also due to climate change, global food prices and child malnutrition across all regions are projected to be higher in 2050.¹⁹ These impacts would be particularly harsh for low-income countries and poor people, who largely depend on agriculture as a source of food and income, and have limited capacity to adapt.

Sub-Saharan Africa needs special attention

Achieving sustainable food security in Sub-Saharan Africa would need special attention. Although the world has made significant progress in economic development and food and nutrition security, hunger and poverty in the region remain severe. Sub-Saharan Africa has also had only slow progress in accelerating agricultural growth and is particularly vulnerable to shocks such as conflicts, climate change, high and volatile food prices, and financial crises. African leaders and donors are committed to promoting growth and reducing poverty and hunger, but are held back by lack of capacity at the regional, national, and community level.

About half of the population lives below \$1.25 a day and the number of poor people in the region almost doubled between 1981 and 2005.²⁰ A look below the \$1 a day poverty line is even more striking as Sub-Saharan Africa is home to three-quarters of the world's ultra poor—those living on less than 50 cents a day—and the number of people living in ultra poverty has increased since 1990.²¹ The depth of poverty, that is, a measure of how far average incomes of the poor fall

¹⁵ Global Economic Symposium. 2008. The crisis of water management. GES 2008 session handout. Schleswig-Holstein, Germany.

¹⁶ OECD. 2008. OECD Environmental Outlook to 2030. Paris, France

¹⁷ For description of the IMPACT model and its implementation, please see Rosegrant, M.W., S. Msangi, C. Ringler, T.B. Sulser, T. Zhu, S.A. Cline. 2008. International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT): Model description. Washington, D.C.: IFPRI.

¹⁸ Nelson, G. C., M. W. Rosegrant, J. Koo, R. Robertson, T. Sulser, T. Zhu, C. Ringler, S. Msangi, A. Palazzo, M. Batka, M. Magalhaes, R. Valmonte-Santos, M. Ewing, and D. Lee. 2009. Climate change: Impact on agriculture and costs of adaptation. Washington, D.C.: IFPRI.

¹⁹ Ibid.

²⁰ Chen and Ravallion. 2008.

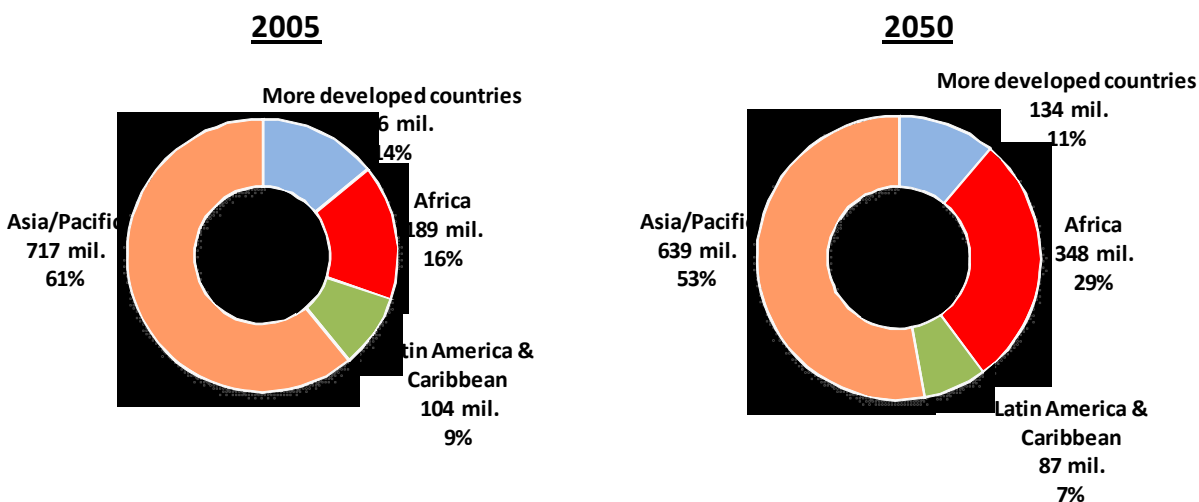
²¹ Ahmed et al. 2007.

below the poverty line, is greater in the region compared to other regions. Additionally, the average consumption of poor people, estimated at around 70 cents per day, is the lowest of all regions.²²

Hunger in Sub-Saharan Africa is equally alarming. More than one-third of the population is estimated to be hungry.²³ High and volatile food prices as well as economic recession resulted in large increases in the number of hungry people between 2004-06 and 2009. According to IFPRI’s Global Hunger Index (GHI), almost all of the countries in which the GHI increased since 1990 were in Sub-Saharan Africa.²⁴ Child mortality and malnutrition also persist in the region. In 2008, 144 out of every 1000 children died before reaching the age of five.²⁵ Between 2003 and 2008, 27 percent of children under five were underweight.²⁶

Rapid population growth also threatens food and nutrition security in Sub-Saharan Africa. The region’s population is projected to increase from 764 million in 2005 to 1.8 billion in 2050.²⁷ The growing youthful population (see Figure 2), in particular, will put extra demands on food systems. Indeed, securing food supplies in a sustainable manner will be central to ensuring food security. Yet, agroecosystems in Sub-Saharan Africa are severely constrained by factors such as droughts, poor infrastructure, undeveloped input and output markets, as well as weak governance and institutions.

Figure 2. World’s youth population (ages 15 to 24)



Source: Data from UN Population Division, World Population Prospects: The 2008 Revision (2009).

Despite the many constraints, agriculture in Sub-Saharan Africa offers opportunities to quickly reduce poverty and enhance food security and economic growth. The sector’s remarkable growth

²² Chen and Ravallion. 2008.

²³ FAO. 2009. State of food insecurity in the world 2009. Rome.

²⁴ von Grebmer et al. 2009.

²⁵ UNICEF (United Nations Children’s Fund). 2009. The state of the world’s children. New York.

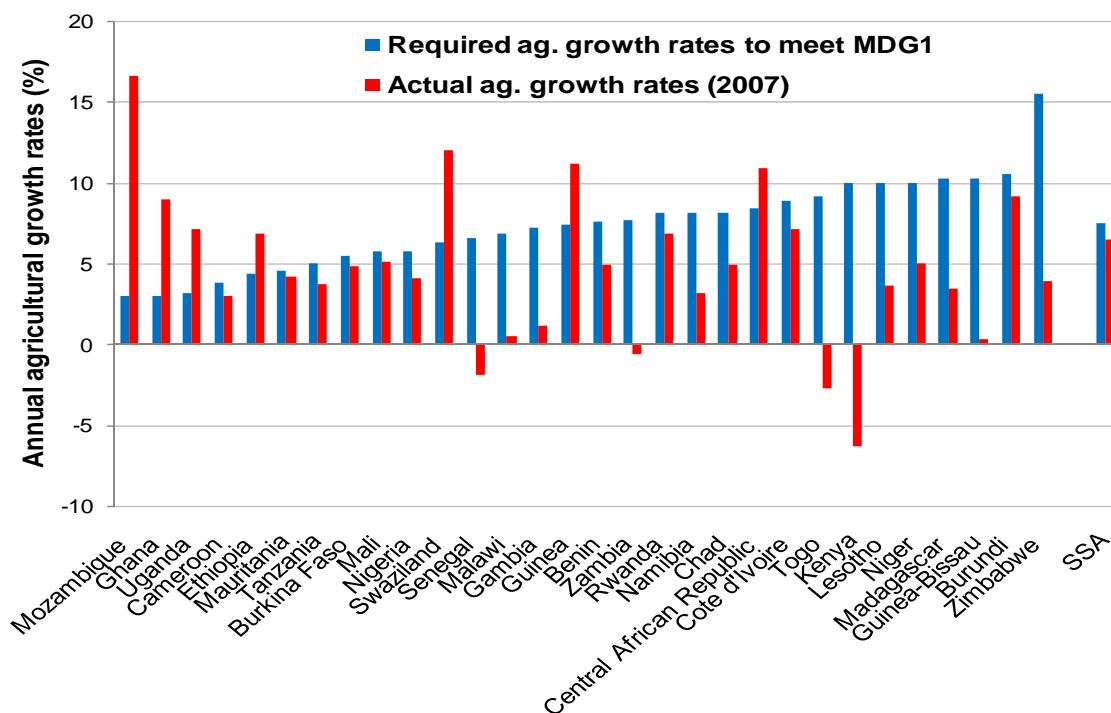
²⁶ Ibid.

²⁷ United Nations Population Division. 2009. World Population Prospects: The 2008 Revision population database. New York.

recovery in the past decade shows promise.²⁸ After several years of decline, growth in Sub-Saharan Africa's agricultural sector outpaced population growth.²⁹ Since the majority of the region's poor is rural and depends on agriculture for their livelihoods, a global collective policy action to accelerate and sustain agricultural sector growth is needed to significantly reduce poverty and hunger. Such policy action will also involve substantial investments in smallholder agriculture, the main form of food production in Sub-Saharan Africa.

Business as usual will not be sufficient to achieve the first Millennium Development Goal (MDG 1) of halving poverty and hunger by 2015 in the region. Costs required to reach this goal are estimated to range from 32 to 39 billion international dollars per annum, suggesting that Sub-Saharan African governments will need to increase their annual spending by 20 percent.³⁰ It is also projected that the average agricultural growth rate needs to increase to 7.5 percent per annum to achieve MDG 1.³¹ The required growth rates differ across countries and current growth rates remain low in many countries (Figure 3).

Figure 3. Required agricultural growth rates to achieve MDG 1



Source: Data from Fan et al. 2008.

²⁸ Badiane, O. 2008. Sustaining and accelerating Africa's agricultural growth recovery in the context of changing global food prices. Washington, D.C.: IFPRI.

²⁹ FAO. 2009. Africa's food challenge. Available at: <http://www.fao.org/news/story/en/item/35770/icode/>.

³⁰ Fan, S., M. Johnson, A. Saurkar, and T. Makombe. 2008. Investing in African Agriculture to halve poverty by 2015. IFPRI Discussion Paper 00751. Washington, D.C.: IFPRI.

³¹ Ibid.

Prioritization of investments in agriculture is also crucial for poverty and hunger reduction, as well as for stimulating economic growth. Even though public spending is one of the most direct and effective mechanisms to promote agricultural growth and poverty reduction, agricultural spending in Sub-Saharan Africa has been historically low compared to that of other regions.³² Recently, many governments have pledged to increase support to agriculture so as to achieve the 6 percent annual agricultural growth goal set by the New Partnership for Africa's Development through the Comprehensive Africa Agriculture Development Programme (CAADP). In compliance with the Maputo Declaration of 2003, governments agreed to allocate 10 percent of their national budgets to agriculture. However, since many countries have limited public resources, progress has been slow and only a handful of countries have met the target.³³ To support the implementation of CAADP and other regional initiatives, IFPRI established a Regional Strategic Analysis and Knowledge Support System (ReSAKSS). The objectives of this Africa-wide network are to promote evidence-based decision-making; improve awareness of the role of agriculture for development; fill knowledge gaps; promote dialogue; and facilitate CAADP benchmarking and review processes.³⁴

Agenda for achieving sustainable food security

To address the current and future threats to food security, as well as exploit the opportunities for increasing food availability, access, stability and utilization, a comprehensive set of investments and policy actions is needed. Policymakers at the global, regional, national, and local level should cooperate to:

1. Improve smallholder productivity and market access

To enhance the productivity of smallholder farmers, investments should be scaled up to improve access to inputs such as seeds and fertilizer, financial and extension services, as well as rural infrastructure including irrigation. Decreasing the risks faced by poor small farmers through innovative insurance schemes is essential to enable them to better deal with weather-related shocks and improve their income and welfare.³⁵ Innovations, including new technologies along the whole food value chain, should also be promoted since they are also crucial for improving the productivity and livelihoods of smallholders and reducing poverty and hunger.³⁶ Connecting farmers to markets through rural feeder roads, information and communication technologies, and new institutional arrangements such as contract farming schemes and producer marketing cooperatives is also essential to reducing their risks and marketing costs. In Bangladesh, for

³² Fan, S., T. Mogue, and S. Benin. 2009. Setting priorities for public spending for agricultural and rural development in Africa. IFPRI Policy Brief 12. Washington, D.C.: IFPRI.

³³ Ibid.

³⁴ For more details, see the ReSAKSS website: <http://www.resakss.org>.

³⁵ Vargas Hill, R. and Torero, M. (eds.). 2010. Innovations in insuring the poor. 2020 Focus Brief 17. Washington, D.C.: IFPRI.

³⁶ Asenso-Okyere, K., K. Davis, and D. Aredo. 2008. Advancing agriculture in developing countries through knowledge innovations. Synopsis of an international conference. Washington, D.C.: IFPRI.

example, paving rural feeder roads reduced transport costs by 36–38 percent, lowered fertilizer prices by 45–47 percent, and increased staple crop prices by 3–5 percent.³⁷

2. Keep trade open

National governments should eliminate existing harmful trade restrictions and refrain from newly-imposed ones so as to reduce food price volatility and enhance the efficiency of agricultural markets. In addition, transparent, fair, and open global trade should be ensured. To achieve these objectives, a quick and favorable completion of the World Trade Organization (WTO) Doha Round is essential. The potential costs of a failed Doha Round could be high. If tariffs increase to the currently allowed WTO limits (bound level), developing country exports would suffer 11.5 percent loss and world welfare would decrease by US\$353 billion.³⁸

3. Promote productive social safety nets

Productive social safety nets should be scaled up to offset the impact of shocks, secure basic livelihoods, and protect poor people from risk and vulnerability. Social safety nets have protective, preventative, promotional, and transformational functions with different objectives. Such objectives include securing and smoothing basic consumption, enabling saving and investment, and building and diversifying assets and avoiding asset depletion.³⁹ The types of interventions with which these objectives can be achieved include conditional cash and/or food transfers, maternal and child health and nutrition programs, public works, and insurance schemes. The choice of programs will depend on the needs, capacities, and resources of the country in which they are implemented.

4. Integrate climate change into strategies at all levels

To reduce the vulnerability of poor people to climate change and moderate the impact of climate change, a combination of adaptation and mitigation strategies is needed at the global, regional, national, basin, and local level. The options for climate change adaptation in agriculture include improved land management, adjustment of planting dates, and introduction of new crop varieties, while the mitigation options include improved energy efficiency and crop yields, and land management techniques to increase carbon storage.⁴⁰ In particular, community-based adaptation strategies that strengthen the community's capacity to cope with disasters, enhance land-management skills, and diversify livelihoods should be supported.⁴¹ Climate change negotiations—following up on the 2009 UN Framework Convention on Climate Change in Copenhagen—need to more effectively incorporate agriculture. Agriculture must be included through three avenues: investments related to agriculture; incentives to reduce emissions and to support technological change; and

³⁷ Minot, N. and R. Vargas Hill. 2007. Developing and connecting markets for poor farmers. 2020 Focus Brief on the World's Poor and Hungry People. Washington, D.C.: IFPRI.

³⁸ Bouët, A., and D. Laborde, 2008. The potential cost of a failed Doha Round, Issue Brief 56. Washington, D.C.: IFPRI.

³⁹ Adato, M. and J. Hoddinott. 2008. Social protection opportunities for Africa. IFPRI Policy Brief 5. Washington, D.C.: IFPRI.

⁴⁰ IPCC (Intergovernmental Panel on Climate Change). 2007. Climate change 2007: Synthesis report. Geneva.

⁴¹ Nelson, et al. 2009.

information and monitoring of land use and soils for verification base.⁴² These actions will ensure that poor smallholders in developing countries are not further threatened by climate change policies and that they could take advantage of new economic opportunities that might arise from the negotiations.⁴³

5. Harmonize food security and sustainability policy

The competition for natural resources and the degradation of environmental assets in many developing countries calls for the development community to place a sharper focus on the harmonization of food security and sustainability policies. Innovative research and development in agricultural technologies plays a crucial role in addressing the challenges and pressures that are facing food systems. For instance, in the area of biotechnology, stress tolerant materials should be further developed to address water scarcity, salinization, and groundwater contamination—though issues regarding the biosafety and transfer of such technologies still need to be resolved.⁴⁴ Other examples of technological innovations include water harvesting, minimum tillage, and integrated soil fertility management. As previously outlined, to achieve sustainable agricultural and rural growth, countries need favorable macroeconomic and trade policies, supporting infrastructure, and smallholders need access to credit, land, and markets. These conditions create level playing fields and give farmers incentives to adopt new and sustainable technologies.

⁴² von Braun, J. and R. Pandya-Lorch. 2009. Introduction—Agriculture and climate change: an agenda for negotiation in Copenhagen for food, agriculture, and the environment. Focus 16. Washington, D.C.: IFPRI.

⁴³ For further information, see Nelson, G.C. (ed.). 2009. Agriculture and climate change: An agenda for negotiation in Copenhagen. 2020 Focus No. 16. Washington, D.C.: IFPRI.

⁴⁴ Rosegrant, M. 2009. Drivers of agricultural growth: Role of science and technology and the challenge of climate change. Presentation at USAID Agriculture and Food Security Roundtable, Washington D.C.